Ústav polymérov SAV

Správa o činnosti organizácie SAV za rok 2017

Bratislava
/január 2018

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1. Základné údaje o organizácii

1.1. Kontaktné údaje

Názov: Ústav polymérov SAV

Riaditeľ: Ing. Igor Lacík, DrSc.

1. zástupca riaditeľa: Mgr. Jaroslav Mosnáček, DrSc.

2. zástupca riaditeľa: Ing. Zuzana Hloušková

Vedecký tajomník: neuvedený

Predseda vedeckej rady: RNDr. Peter Cifra, DrSc.

Člen snemu SAV: Ing. Igor Lacík, DrSc.

Adresa: Dúbravská cesta 9, 845 41 Bratislava 45

http://www.polymer.sav.sk

Tel.: 02/3229 4307
Fax:
E-mail: upolpodh@savba.sk

Názvy a adresy detašovaných pracovísk:

- **Detašované pracovisko Ústavu polymérov SAV**
  ul. Gen. Svobodu 1069/4, 958 01 Partizánske
- **Detašované pracovisko Ústavu polymérov SAV - Pavilón materiálových vied**
  Dúbravská cesta 9/6319, Bratislava

Vedúci detašovaných pracovísk:

- **Detašované pracovisko Ústavu polymérov SAV**
  Prof. Ing. Ivan Chodák, DrSc.
- **Detašované pracovisko Ústavu polymérov SAV - Pavilón materiálových vied**
  Ing. Mária Omastová, DrSc.

Typ organizácie: Príspevková od roku 1993

1.2. Údaje o zamestnancoch

Tabuľka 1a Počet a štruktúra zamestnancov

Štruktúra zamestnancov	K	K		K do 35 rokov		F	P	T
		M	Ž	M	Ž			
Celkový počet zamestnancov	88	33	55	9	20	81	61,37	42,4
Vedeckí pracovníci	44	22	22	3	10	37	33,2	30,95
Odborní pracovníci VŠ (výskumní a vývojoví zamestnanci[1])	26	8	18	6	10	26	13,28	11,45
Odborní pracovníci VŠ (ostatní zamestnanci[2])	1	0	1	0	0	1	1	0
Odborní pracovníci ÚS	13	1	12	0	0	13	11,09	0
Ostatní pracovníci	4	2	2	0	0	4	2,8	0

[1] odmeňovaní podľa 553/2003 Z.z., príloha č. 5
[2] odmeňovaní podľa 553/2003 Z.z., príloha č. 3 a č. 4

K – kmeňový stav zamestnancov v pracovnom pomere k 31.12.2017 (uvádzať zamestnancov v pracovnom pomere, vrátane riadnej materskej dovolenky, zamestnancov pôsobiacich v zahraničí, v štátnych funkciách, členov Predsedníctva SAV, zamestnancov pôsobiacich v zastupiteľských zboroch)
F – fyzický stav zamestnancov k 31.12.2017 (bez riadnej materskej dovolenky, zamestnancov pôsobiacich v zahraničí v štátnych funkciách, členov Predsedníctva SAV, zamestnancov pôsobiacich v zastupiteľských zboroch)
P – celoročný priemerný prepočítaný počet zamestnancov
T – celoročný priemerný prepočítaný počet riešiteľov projektov
M, Ž – muži, ženy

Tabuľka 1b Štruktúra vedeckých pracovníkov (kmeňový stav k 31.12.2017)

Rodová skladba	Pracovníci s hodnosťou				Vedeckí pracovníci v stupňoch		
	DrSc.	CSc./PhD.	prof.	doc.	I.	II.a.	II.b.
Muži	8	15	2	0	8	8	6
Ženy	1	21	0	0	1	4	17

Tabuľka 1c Štruktúra pracovníkov podľa veku a rodu, ktorí sú riešiteľmi projektov

Veková štruktúra (roky)	< 31	31-35	36-40	41-45	46-50	51-55	56-60	61-65	> 65
Muži	8	1	6	4	1	1	0	3	4
Ženy	10	8	3	1	1	1	1	5	2

Tabuľka 1d Priemerný vek zamestnancov organizácie k 31.12.2017

	Kmeňoví zamestnanci		Vedeckí pracovníci		Riešitelia projektov	
	A	B	A	B	A	B
Muži	46,6	47,6	48,9	46,8	44,0	45,7

Ženy	43,0	45,2	36,9	36,6	40,7	43,8
Spolu	44,3	46,1	42,9	41,7	42,2	44,7

A - Prepočet bez zohľadnenia úväzkov zamestnancov
B - Prepočet so zohľadnením úväzkov zamestnancov

1.3. Iné dôležité informácie k základným údajom o organizácii a zmeny za posledné obdobie (v zameraní, v organizačnej štruktúre a pod.)

Život ústavu bol v roku 2017 ovplyvnený výsledkami akreditácie, ktoré boli oznámené začiatkom roka 2017. Išlo o historicky prvé nezávislé hodnotenie akadémie nezávislými zahraničnými expertami za účelom získať profesionálny a objektívny pohľad na súčasný stav vedy na Slovensku a jej nezávislé zhodnotenia na medzinárodnej úrovni. Preto bolo pre náš ústav potešiteľné, že v rámci takéhoto hodnotenia sme boli zaradený do najvyššej kategórie A, ako jeden z dvoch ústavov SAV.
V decembri 2017 sa uskutočnila voľba do Vedeckej rady Ústavu polymérov. Za členov VR boli opätovne zvolení Mgr. Martin Danko, PhD., Ing. Matej Mičušík, PhD., Mgr. Jaroslav Mosnáček, DrSc., Mgr. Juraj Kronek, PhD., Prof. Ing. Ivan Hudec, PhD. (externý člen) a Prof. Mgr. Radovan Šebesta, DrSc. (externý člen). Za nových členov boli zvolení Ing. Anita Eckstein, PhD., Mgr. Zuzana Benková, PhD a Prof. Ing. Marián Valko, DrSc. (externý člen).
V roku 2017 sa Ústav polymérov SAV opäť podieľal na príprave niekoľkých projektov v rámci Horizont 2020 a M-Era.Net. Tieto projekty všeobecne predstavujú kvalitatívny rast pre zúčastnených vedeckých pracovníkov a doktorandov a tiež prispievajú k ekonomickej situácii ústavu. Preto i v roku 2018 podávanie projektov v rámci nového programu EU pre podporu vedy a výskumu Horizont 2020 bude predstavovať jednu z priorít pre budúci rast ústavu. Okrem toho boli počas roka podané tri projekty V4-Korea, z ktorých jeden bol schválený. Znovu bol získaný aj významný Juvenile Diabetes Research Foundation projekt. V novembri bolo podaných celkovo osem APVV projektov (z toho v 3 je ÚPo SAV nositeľom projektu a v 5 sa zmluvne podieľa na riešení projektu), ktoré budú vyhodnotené v prvej polovici roku 2018. Vedeckí pracovníci ÚPo riešili dva projekty spolupráce SAV s Tureckom, resp. Taiwanom, 1 ERA.NET projekt a 4 COST projekty ale i významný medzinárodný The Chicago Diabetes Project a kontrakt s firmou BASF.
Na ústave taktiež pôsobili študenti so slovenských ale i dvoch britských VŠ ako vedecké pomocné sily, jeden vysokoškolák z Poľska cez ERASMUS a stredoškolskí študenti v rámci stredoškolskej odbornej práce. Je však stále potrebné viac diskutovať o možnostiach, akým spôsobom aktívnejšie a efektívnejšie prezentovať ÚPo SAV medzi študentami vysokých škôl a zefektívniť získavanie kvalitných študentov a doktorandov z ich radov.
V roku 2017 sa na ÚPo SAV taktiež rozšírila základňa pracovníkov s vyšším vedeckým stupňom – jeden vedecký pracovník bol preradený do kategórie I a jeden vedecký pracovníci do IIa.

2. Vedecká činnosť

2.1. Domáce projekty

Tabuľka 2a Domáce projekty riešené v roku 2017

ŠTRUKTÚRA PROJEKTOV	Počet		Čerpané financie (€)					
			A				B	
			Zo zdrojov SAV		Z iných zdrojov		Zo zdrojov SAV	Z iných zdrojov
	A	B	Spolu	Pre organi-záciu	Spolu	Pre organi-záciu		
1. Projekty VEGA	14	1	-	-	117360	-	-	-
2. Projekty APVV	8	11	-	-	304847	-	-	117766
3. Projekty OP ŠF	0	0	-	-	-	-	-	-
4. Projekty SASPRO	0	0	-	-	-	-	-	-
5. Projekty centier excelentnosti SAV	0	0	-	-	-	-	-	-
6. Iné projekty (FM EHP, ŠPVV, Vedecko-technické projekty, ESF, na objednávku rezortov a pod.)	0	0	-	-	-	-	-	-

A - organizácia je nositeľom projektu
B - organizácia sa zmluvne podieľa na riešení projektu

Tabuľka 2b Domáce projekty podané v roku 2017

Štruktúra projektov	Miesto podania	Organizácia je nositeľom projektu	Organizácia sa zmluvne podieľa na riešení projektu
1. Účasť na nových výzvach APVV r. 2017	-	3	4
2. Projekty výziev OP ŠF podané r. 2017	Bratislava	0	0
	Regióny		

2.2. Medzinárodné projekty

2.2.1. Medzinárodné projekty riešené v roku 2017

Tabuľka 2c Medzinárodné projekty riešené v roku 2017

ŠTRUKTÚRA PROJEKTOV	Počet		Čerpané financie (€)					
			A				B	
			Zo zdrojov SAV		Z iných zdrojov		Zo zdrojov SAV	Z iných zdrojov
	A	B	Spolu	Pre organizáciu	Spolu	Pre organizáciu		
1. Projekty 7. RP EÚ a Horizont 2020	3	0	-	-	203916	-	-	-
2. Projekty ERA.NET, ESA, JRP	0	1	-	-	-	-	-	-
3. Projekty COST	0	3	-	-	-	-	-	-
4. Projekty EUREKA, NATO, UNESCO, CERN, IAEA, IVF, ERDF a iné	4	5	-	-	40988	-	-	-
5. Projekty v rámci medzivládnych dohôd	0	0	-	-	-	-	-	-
6. Bilaterálne projekty MAD	3	0	-	-	-	-	-	-
7. Bilaterálne projekty ostatné	5	1	-	-	-	-	-	-
8. Podpora MVTS z národných zdrojov (SAV, APVV a iné)	0	7	-	-	-	-	-	41199
9. Iné projekty	2	1	-	-	70597	-	-	-

A - organizácia je nositeľom projektu
B - organizácia sa zmluvne podieľa na riešení projektu

2.2.2. Medzinárodné projekty Horizont 2020 podané v roku 2017

Tabuľka 2d Počet projektov Horizont 2020 v roku 2017

	A	B
Počet podaných projektov Horizont 2020	0	2

A - organizácia je nositeľom projektu
B - organizácia sa zmluvne podieľa na riešení projektu

Údaje k domácim a medzinárodným projektom sú uvedené v Prílohe B.

2.2.3. Zámery na čerpanie štrukturálnych fondov EÚ v ďalších výzvach

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2.3. Najvýznamnejšie výsledky vedeckej práce (maximálne 1000 znakov + 1 obrázok; bibliografický údaj uvádzajte rovnako ako v zozname publikačnej činnosti, vrátane IF)

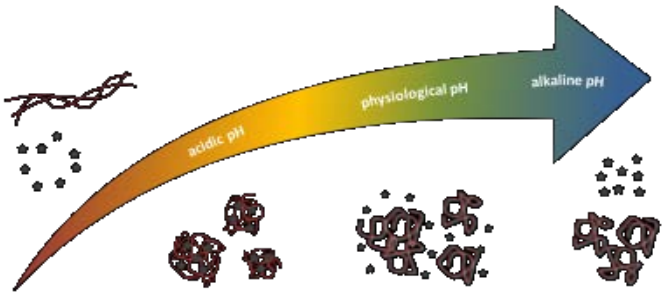
2.3.1. Základný výskum

1) Názov: <u>Chitozán/TPP komplexy a ich pH-senzitivita.</u>
Chitosan/TPP complexes and their pH-sensitivity.

Ústav polymérov SAV

Mená riešiteľov**:** Petra Mazancová, Veronika Némethová, Lucia Kleščíková, Dušana Treľová, Igor Lacík, Filip Rázga

Projekty v rámci ktorých sa výsledok dosiahol: VEGA 2/0094/15; VEGA 2/0113/15; SASPRO 0057/01/02; APVV-15-0215; APVV-16-0579



Chitozán/TPP komplexy sa rozpadávajú na individuálne komponenty po expozícii do prostredia s pH vyšším ako pH, ktoré bolo použité pri ich príprave. Chitozán/TPP komplexy de facto neexistujú vo fyziologických podmienkach.

V hodnotiacom období sme zásadným spôsobom zodpovedali fundamentálnu otázku existencie chitozán/TPP polyelektrolytových komplexov vo fyziologickom prostredí, presnejšie v prostredí s pH vyšším ako pH, ktoré bolo použité pri ich príprave. Keďže komplexy chitozánu a TPP sú tvorené na základe nekovalentných, elektrostatických interakcií medzi kladne nabitými NH_3^+ skupinami chitozánu a záporne nabitými O^- skupinami TPP, sú tieto komplexy principiálne citlivé na pH. No i napriek tomu, že chitozán/TPP komplexy boli nespočetne veľakrát testované v podmienkach *in vitro* alebo dokonca *in vivo*, je zarážajúce, že žiadna z týchto štúdií sa nezaujímala o charakteristiky a vlastnosti týchto komplexov v danom, fyziologickom prostredí, t.j. pri pH 7,4. Prekvapivé je na tom najmä to, že je všeobecne známe a akceptované, že chitozán pri pH vyššom ako je hodnota jeho pKa, typicky okolo 6,3, dramaticky stráca počet NH_3^+ skupín, ktoré sa menia na nenabité NH_2 skupiny a chitozán sa tak stáva nerozpustný a teda fázovo separovaný. Práve z tohto dôvodu sa chitozán/TPP komplexy pripravujú za kyslých podmienok. Ich aplikácia do podmienok fyziologických (navyše bez akejkoľvek charakterizácie ich fyzikálno-chemických vlastností) môže mať vskutku fatálny dopad na vyhodnotenie, interpretáciu a koreláciu so získanými biologickými dátami. Fyzikálno-chemické vlastnosti týchto systémov vo fyziologickom prostredí sa totiž môžu pomerne zásadným spôsobom líšiť od tých, ktoré majú po
príprave v prostredí kyslom.
V tomto kontexte sme skúmali správanie chitozán/TPP komplexov v prostrediach s rôznym pH (kyslé, neutrálne a zľahka bázické) a cez fyzikálnu podstatu interakcií sme hľadali odpoveď na dve fundamentálne otázky, (1) či tieto systémy vôbec existujú pri fyziologickom pH a (2) či sa ich zloženie zmení, keď sa exponujú prostrediu s pH vyšším ako bolo pH použité pri ich príprave. Náš

kombinovaný experimentálny a teoretický prístup poskytol nepriestrelné dôkazy o tom, že po vystavení chitozán/TPP komplexov fyziologickému pH alebo všeobecne akémukoľvek pH, ktoré je vyššie ako to, ktoré sa použilo pri ich príprave, tieto komplexy podstupujú postupnú dezintegráciu do voľných molekúl chitozánu a TPP, pričom v prípade chitozánu sú tieto navyše fázovo separované.
Evidentná a takmer okamžitá dezintegrácia chitozán/TPP komplexov po vystavení fyziologickému pH predstavuje zmenu paradigmy v chápaní chitozánových kompexov nielen v súvislosti s koreláciou s biologickými dátami, ale, čo je dôležitejšie, vzhľadom na ich celkový translačný potenciál. Komplexy chitozánu a TPP pripravené za kyslých podmienok jednoducho neexistujú pri fyziologickom pH, ale okamžite sa transformujú na voľné chitozánové reťazce a reziduálne TPP.
Konsekvencie plynúce z týchto dát, ako aj samotné dáta (spolu s rozborom literatúry a procesu prípravy, ktorý sme publikovali minulé hodnotiace obdobie) predstavujú jedinečný celok, ktorý nastavuje zrkadlo nielen danej vedeckej komunite, ale všeobecne vedeckej obci vyvíjajúcej polyelektrolytové komplexy pre biomedicínske aplikácie, že bez detailnej charakterizácie sa enormne zvyšuje riziko generovania mylných záverov a interpretácií. Vlastnosti polyelektrolytových systémov získané po procese prípravy sa totiž dramaticky menia/môžu meniť v prostredí aplikačnom.

Výstupy:

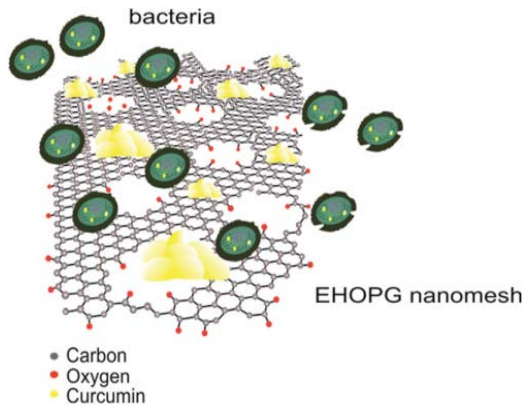
1. MAZANCOVÁ, Petra - NÉMETHOVÁ, Veronika - LACÍK, Igor - RÁZGA, Filip*. Chitosan-based particles: The (forgotten) interplay between process, properties and performance. In *Materials Science and Engineering C: Materials for Biological Applications*, 2017, vol. 71, p. 570-571. (4,164 - IF2016). ISSN 0928-4931.
2. MAZANCOVÁ, Petra - NÉMETHOVÁ, Veronika – TREĽOVÁ, Dušana – KLEŠČÍKOVÁ, Lucia – LACÍK, Igor – RÁZGA, Filip Disintegration of chitosan/tripolyphosphate complexes into separate components upon pH elevation. Odoslané do *Carbohydr Polym.* . (4,811-IF2016).

2) Názov: Antibakteriálne nanokompozity na báze kvantových bodiek.
Antibacterial nanocomposites based on quantum dots.

Ústav polymérov SAV

Mená riešiteľov: Zoran Markovic, Zdenko Špitalský, Mária Kováčová

Projekty v rámci ktorých sa výsledok dosiahol: SASPRO 1237/02/02



Pripravili sa nové hybridné nanomateriály na báze nanosieťovaného grafénu s kurkumínom, u ktorých sa potvrdila antimikrobiálna aktivita. Následne sa podarilo aplikovať grafénové alebo karbónové kvantové bodky do polymérnych matríc (silikóny alebo polyuretány) metódou napučiavania. Na pripravených materiáloch sa následne testovala antibakteriálna aktivita. Opakované testy vymývania preukázali stálosť kvantových bodiek na povrchu polymérov. Potvrdila sa fotodynamická aktivita hydrofóbnych kvantových bodiek aj po enkapsulácii do polymérnych reťazcov. Získané polymérne nanokompozity s fotocitlivými uhlíkovými kvantovými bodkami eradikovali Escherichia Coli a Staphylococcus aureus po jednej hodine ožiarenia viditeľným svetlom z LED diódy. Získané výsledky nájdu využitie predovšetkým v medicínskych zariadeniach.

Výstupy:

1. ŠPITÁLSKY, Zdenko – MARKOVIC, Zoran M. Patentová prihláška č. 50017-2017 „Spôsob výroby nanokompozitného materiálu s antibakteriálnymi vlastnosťami, takýto materiál a jeho použitie“, marec 2017, v štádiu posudzovania.
2. MARKOVIĆ, Zoran M. - MATIJAŠEVIĆ, D. M. - PAVLOVIĆ, V. B. - JOVANOVIĆ, S. P. - HOLCLAJTNER-ANTUNOVIĆ, I. D. - ŠPITÁLSKY, Zdenko - MIČUŠÍK, Matej - DRAMIĆANIN, M. D. - MILIVOJEVIĆ, D. D. - NIKŠIĆ, M. P. - TODOROVIĆ MARKOVIĆ, B. M. Antibacterial potential of electrochemically exfoliated graphene sheets. In *Journal of Colloid and Interface Science,* 2017, vol. 500, p. 30-43. (4.233 - IF2016). ISSN 0021-9797. Typ: ADCA
3. MARKOVIĆ, Zoran M. - KEPIĆ, D. P. - MATIJAŠEVIĆ, D. M. - PAVLOVIĆ, V. B. - JOVANOVIĆ, S. P. - STANKOVIĆ, N. K. - MILIVOJEVIĆ, D. D. - ŠPITALSKÝ, Zdenko - HOLCLAJTNER-ANTUNOVIĆ, I. D. - BAJUK-BOGDANOVIĆ, D. V. - NIKŠIĆ, M. P. - TODOROVIĆ-MARKOVIĆ, B. M. Ambient light induced antibacterial action of curcumin/graphene nanomesh hybrids. In *RSC Advances,* 2017, vol. 7, p. 36081-36092. (3.108 - IF2016). ISSN 2046-2069. Typ: ADCA
4. JOVANOVIĆ, S. - MARKOVIĆ, Zoran M. - MARKOVIĆ, B. T. Carbon based nanomaterials as agents for photodynamic therapy. In *Photodynamic Therapy (PDT). Principles, Mechanisms and Applications*. - New York, USA : Nova Science Publishers, Inc., 2017, chapter 2, P. 35-108. ISBN 978-1-53611-912-1. Typ: ABC
5. JOVANOVIĆ, S. P. - MARKOVIĆ, Zoran M. - SYRGIANNIS, Z. - DRAMIĆANIN, M. D. - ARCUDI, F. - LA PAROLA, V. - BUDIMIR, M. D. - MARKOVIĆ, B. M. Todorović. Enhancing photoluminescence of graphene quantum dots by thermal annealing of the graphite precursor. In *Materials Research Bulletin,* 2017, vol. 93, p. 183-193. (2.446 - IF2016). ISSN 0025-5408. Typ: ADCA
6. PREKODRAVAC, J. R. - MARKOVIĆ, Zoran M. - JOVANOVIC, S. P. - HOLCLAJTNER-ANTUNOVIĆ, I. D. - KEPIĆ, D. P. - BUDIMIR, M. D. - TODOROVIĆ-MARKOVIĆ, B. M. Graphene quantum dots and fullerenol as new carbon sources for single-layer and bi-layer graphene synthesis by rapid thermal annealing method. In *Materials Research Bulletin,* 2017, vol. 88, p. 114-120. (2.446 - IF2016). ISSN 0025-5408. Typ: ADCA
7. TOMIĆ, S. - JANJETOVIĆ, K. - MIHAJLOVIĆ, D. - MILENKOVIĆ, M. - KRAVIĆ-STEVOVIĆ, T. - MARKOVIĆ, Zoran M. - TODOROVIĆ-MARKOVIĆ, B. - ŠPITÁLSKY, Zdenko - MIČUŠÍK, Matej - VUCEVIĆ, D. - ČOLIĆ, M. - TRAJKOVIĆ, V. Graphene quantum dots suppress proinflammatory T cell responses via autophagy-dependent induction of tolerogenic dendritic cells. In *Biomaterials,* 2017, vol. 146, p. 13-28. (8.402 - IF2016). ISSN 0142-9612. Typ: ADCA
8. ŠPITÁLSKY, Zdenko - MARKOVIĆ, Zoran M. - KOVÁČOVÁ, Mária. Nové antibakteriálne materiály s regulovateľným antibakteriálnym účinkom. In Prešporský podnikateľ: mesačník Bratislavskej regionálnej komory SOPK, 2017, roč. X, č. 4, s. 5. ISSN 1337-8295. Typ: BDF
9. ŠPITÁLSKY, Zdenko - MARKOVIĆ, Zoran M. - KOVÁČOVÁ, Mária. Liečba svetlom. In Quark, 2017, roč. 23, č. 9, s. 12-13. ISSN 1337-8422. Typ: BDF

3) Názov: Správanie makromolekúl v poli cylindrických nanopostov.
Behavior of macromolecules in a field of cylindrical nanoposts.

Ústav polymérov SAV

Mená riešiteľov: Peter Cifra, Zuzana Benková, Lucia Rišpanová

Projekty v rámci ktorých sa výsledok dosiahol: APVV-15-0323, VEGA 2/0055/16

Molekulovými simuláciami sa študovali konformácie polotuhých makromolekúl v poli cylindrických nanopostov pri zmenách geometrie nanopostov, tuhosti makromolekúl a ich topológie. V takto obmedzenom priestore dochádza k distribúcii reťazca medzi viacero intersticiálnych objemov. Tuhšie reťazce penetrujú medzi nanopostami ľahšie a zaberajú viacero intersticiálnych objemov. Pole nanopostov je možné reprezentovať semi-kvantitatívne ako kombináciu intersticiálneho objemu s geometriou cylindrického kanálu a priechodu medzi týmito

priestormi v tvare úzkej štrbiny. Ak je voľná energia v obidvoch priestoroch rovnaká dochádza k penetrácii reťazca cez štrbiny do ďalších intersticiálnych objemov. Táto aproximácia umožňuje vysvetlit aj nemonotónne vystieranie reťazcov v smere pozdĺž nanopostov pri zahusťovaní nanopostami s konštantnou šírkou štrbiny medzi postami. Prechod v správaní je dôsledkom súťaže medzi vystieraním reťazca v intersticiálnom objeme a jeho penetráciou medzi postami a je citlivý na zmeny v tuhosti reťazca. Okrem lineárnych sa študovali aj cyklické polyméry. Štúdia môže objasniť správanie DNA v nanofluidných zariadeniach.

Výstupy:

1. BENKOVÁ, Zuzana - RIŠPANOVÁ, Lucia - CIFRA, Peter. Structural behavior of a semiflexible polymer chain in an array of nanoposts. In *Polymers : Open Access Polymer Science Journal*, 2017, vol. 9, art. no. 313. (3.364 - IF2016). ISSN 2073-4360. Dostupné na internete: .
2. BENKOVÁ, Zuzana - RIŠPANOVÁ, Lucia - CIFRA, Peter. Effect of chain stiffness for semiflexible macromolecules in array of cylindrical nanoposts. In *Journal of Chemical Physics*, 2017, vol.147, art.no. 134907. (2.965 - IF2016). (2017 - Current Contents, WOS, SCOPUS). ISSN 0021-9606.

2.3.2. Aplikačný typ

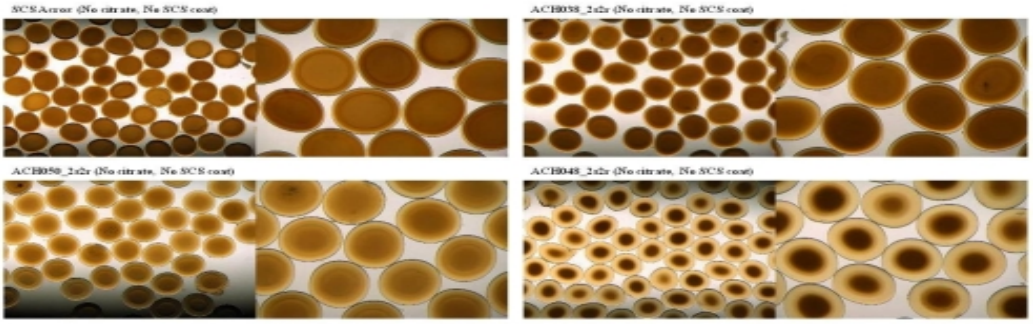
1) Názov: Syntéza sodnej soli sulfátu celulózy pre prípravu PMCG polymérnych mikrokapsúl pre transplantáciu enkapsulovaných pankreatických ostrovčekov.
Synthesis of sodium cellulose sulfate for preparation of PMCG microcapsules used for transplantation of encapsulated pancreatic islets.

Ústav polymérov SAV

Mená riešiteľov: Vladimír Raus, Lucia Kleščíková, Zuzana Kroneková, Michal Pelach, Petra Mazancová, Lucia Uhelská, Dušana Treľová, Filip Rázga, Veronika Némethová, Igor Lacík zodpovedný riešiteľ

Projekty, v rámci ktorých sa výsledok dosiahol: Projekty Enkapsulačného konzorcia JDRF 2-SRA-2014-288-Q-R a 2-SRA-2018-521-S-B, APVV-14-0858

Sodná soľ sulfátu celulózy (SCS) je základnou zložkou polyelektrolytových PMCG mikrokapsúl. Komerčný produkt už nie je dostupný a bolo nutné pristúpiť k jeho syntéze. Bola zosyntetizovaná sada SCS za rôznych experimentálnych podmienok líšiacich sa v type východiskovej celulózy, jej úprave, koncentrácii reakčných zmesí, množstve sulfatačného činidla, reakčnej teplote, spôsobe neutralizácie a izolácie produktu. Cieľom bolo získať produkt, ktorý by sa vlastnosťami približoval ku komerčnému SCS. Testovanie pripravených SCS viedlo k vzniku mikrokapsúl s požadovanými charakteristikami. Zároveň sa nám podarilo splniť požiadavku, aby pripravené mikrokapsuly nespôsobovali nežiadúcu odozvu v *in vivo* prostredí po implantácii do peritoneálnej dutiny imunokompetentných C57bl/6 myší, t.j. neobrastali fibrotickým tkanivom. Tento krok je významný pre pokračovanie našich prác smerovaných k predklinickému testovaniu daných mikrokapsúl v primátoch.



PMCG mikrokapsuly pripravené z 3 šarží syntetizovaného SCS (ACH038, ACH048, a ACH050) a komerčného SCS Acros (A0319391) ako referenčnej vzorky, explantované po 2 týždňoch z C57bl/6 myšieho modelu.

Výstupy:

1. GRAVASTRAND, C. - HAMAD, S. - FURE, H. - STEINKJER, B. - RYAN, L. - OBERHOLZER, J. - LAMBRIS, J. D. - LACÍK, Igor - MOLLNES, T. E. - ESPEVIK, T. - BREKKE, O.-L. - ROKSTAD, A. M. Alginate microbeads are coagulation compatible, while alginate microcapsules activate coagulation secondary to complement or directly through FXII. In *Acta biomaterialia*, 2017, vol. 58, p. 158-167. (6,319 - IF2016). ISSN 1742-7061.
2. KRAJČOVIČ, T. - BUČKO, M. - VIKARTOVSKÁ, A. - LACÍK, Igor - UHELSKÁ, Lucia - CHORVÁT, D. - NEDĚLA, V. - TIHLAŘÍKOVÁ, E.- GERICKE, M. - HEINZE, T. - GEMEINER, P. Polyelectrolyte complex beads by two-step process for improved performance of viable whole-cell Baeyer-Villiger monoxygenase by immobilization. In *Catalysts* 2017, vol. 7 (353), p.1-12 (3,082 - IF2016). ISSN 2073-4344.

2) Názov: Materiály pre 3D tlač.
Materials for 3D printing.

Ústav polymérov SAV

Mená riešiteľov: Zdeno Špitalský, Mária Kováčová

Projekty v rámci ktorých sa výsledok dosiahol: VEGA 2/0093/16

V spolupráci s firmou 3Dimenzia sa pripravili polymérne kompozity na báze PET s uhlíkovými vláknami, expandovaným grafitom alebo ich vzájomnou kombináciou. Všetky pripravené kompozitné materiály boli vhodné na 3D tlač pomocou technológie FDM, majú vyšší Youngov modul a vyšší elastický modul pri 25 °C ako polymér bez plniva. Prídavok plniva do polymérnej matrice mal len malý vplyv na termickú stabilitu. Pripravené kompozitné materiály na báze recyklovaného PET mali porovnateľné vlastnosti s kompozitmi na báze PET, čo má ekonomický a ekologický význam. Nové a lacnejšie materiály môžu prispieť k rozšíreniu 3D tlače do výrobných závodov a použitiu 3D tlačiarní na špeciálne aplikácie. V súčasnosti sa rieši ich komerčná výroba.

Výstupy:

1. ŠPITALSKÝ, Zdenko – KOVÁČOVÁ, Mária – ĎURIŠ, V. – VYSOPAL, M. – SVOBODA, P. Polymérne kompozity pre 3D tlač. Užitkový vzor č.255-2017, november 2017.
2. KOZAKOVIČOVÁ, J. - KOVÁČOVÁ, Mária - MARKOVIĆ, Zoran M. - ŽIGO, Ondrej - CSOMOROVÁ, Katarína - VYSOPAL, M. - ŠPITÁLSKY, Zdenko. New carbon based polymer composites for 3D printing of automotive parts. In PMA 2017 & SRC 2017 : International Conference on Polymeric Materials in Automotive : 23rd Slovak Rubber Conference : book of proceedings. Techn.red. D. Jochec-Mošková. - Bratislava, Slovakia : Slovak University of Technology, Faculty of Chemical and Food Technology & Polymer Institute of SAS, 2017, p. 198-199. ISBN 978-80-89841-04-2.(PMA 2017 & SRC 2017 : International Conference on Polymeric Materials in Automotive : Slovak Rubber Conference). Typ: AFD
3. ŠPITÁLSKY, Zdenko - KOZAKOVIČOVÁ, J. - KOVÁČOVÁ, Mária - PROCHÁZKA, Michal - ŽIGO, Ondrej - CSOMOROVÁ, Katarína - VYSOPAL, M. Polymérne kompozity pre 3D tlač. In ChemZi : Slovenský časopis o chémii pre chemické vzdelávanie, výskum a priemysel, 2017, roč. 13, č. 1, s. 107-108. ISSN 1336-7242. Typ: AFH

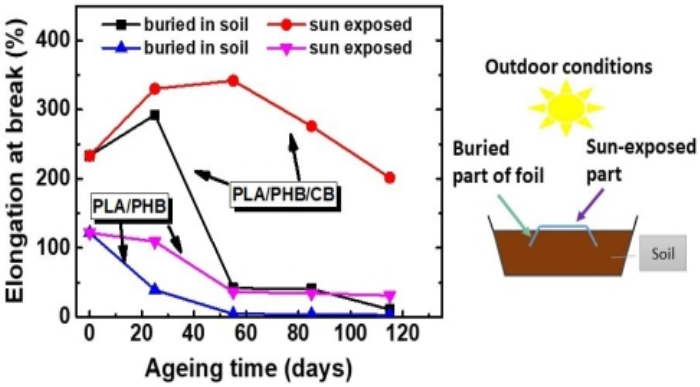
3) Názov: Príprava a charakterizácia biodegradovateľných fólií na báze PLA/PHB zmesí a ich aplikácia v poľnohospodárstve.
Preparation and characterization of biodegradable PLA/PHB based blends and its application in agriculture.

Ústav polymérov SAV

Mená riešiteľov: Katarína Mosnáčková, Ivan Chodák, Martin Danko, Alena Šišková, Ivica Janigová, Štefan Chmela, Jaroslav Mosnáček.

Projekty v rámci ktorých sa výsledok dosiahol: projekty VEGA 2/0108/14 a 2/0158/17, APVV-15-0528.

Boli pripravené polymérne zmesi a kompozity na báze PLA/PHB, ktoré sa vo forme fólií testovali pre potenciálne aplikácie v obalovom priemysle a poľnohospodárstve. Študovali sa zmeny fyzikálnych vlastností počas UV ožarovania, hydrolýzy, mineralizácie a prírodného starnutia v simulovaných pôdnych podmienkach.



Changes in ellongation at break for foils of PLA/PHB blend and PLA/PHB/carbon black composite after various outdoor weathering.

Výsledky fotodegradácie poukázali na výrazný stabilizačný účinok prítomných sadzí, ktoré významne ovplyvnili najmä mechanické vlastnosti kompozitu. Nárast predĺženia pri pretrhnutí počas UV ožarovania bol sinergickým efektom viacerých vplyvov najmä ako dôsledok nukleačného a stabilizačnému účinku plniva v kombinácii s potlačenou sekundárnou kryštalizáciou počas starnutia. V prípade neplnených zmesí bol pozorovaný výraznejší pokles molových hmotností v dôsledoku hydrolytického štiepenia podobne ako v priebehu hydrolýzy vodnými parami. Počas prírodného starnutia v pôde v obidvoch prípadoch (zmesi a kompozitu) dochádzalo k výraznému zhoršeniu mechanických vlastností už po 30 dňoch aplikácie. Po 60 dňoch boli predĺženia pri pretrhnutí v prípade neplnených fólií pod hranicou 5 %. Testované materiály boli študované aj z hľadiska fyzikálneho starnutia, kde sa výrazné zmeny v mechanických vlastnostiach nepozorovali.

Výstupy:

1. MOSNÁČKOVÁ, Katarína - DANKO, Martin - ŠIŠKOVÁ, Alena - FALCO, L. M. - JANIGOVÁ, Ivica - CHMELA, Štefan - VANOVČANOVÁ, Z. - OMANÍKOVÁ, L. - CHODÁK, Ivan - MOSNÁČEK, Jaroslav. Complex study of the physical properties of a poly(lactic acid)/poly(3-hydroxybutyrate) blend and its carbon black composite during various outdoor and laboratory ageing conditions. In RSC Advances, 2017, vol. 7, p. 47132-47142. (3.108 - IF2016). (2017 - Current Contents). ISSN 2046-2069. Typ: ADCA

2.3.3. Medzinárodné vedecké projekty

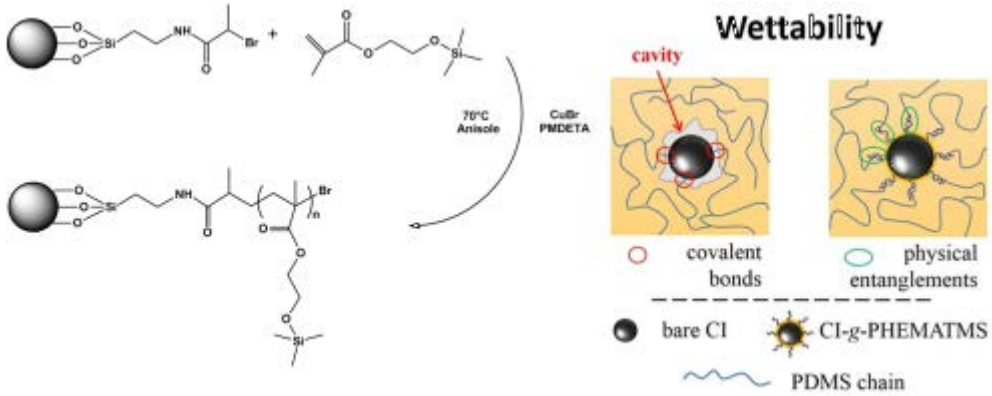
1) Názov: Modifikácia povrchu (nano)častíc polymerizáciou iniciovanou z povrchu ako nástroj pre zlepšenie vlastností finálnych materiálov.
Modification of (nano)particles surface using surface initiated polymerization for improvement of the properties of final materials.

Ústav polymérov SAV

Mená riešiteľov: Markéta Ilčíková, Jaroslav Mosnáček

Projekty v rámci ktorých sa výsledok dosiahol: v rámci medzinárodnej spolupráce s Univerzitou Tomáša Baťu v Zline

V rámci spolupráce s Universitou Tomáša Batu v Zlíne sa častice karbonylového železa a nanočastice grafén oxidu kovalentne modifikovali za účelom naviazania iniciátora na povrch týchto (nano)častíc. Následne sa použila radikálová polymerizácia s prenosom atómu iniciovaná z povrchu na kovalentnú modifikáciu povrchu týchto (nano)častíc rôznymi typmi polymérnych reťazcov.



Pripravené hybridné častice karbonylového železa sa následné využili v magnetoreologických systémoch, kde vďaka polymérnemu obalu mali častice zlepšenú kompatibilitu s matricou a/alebo silikónovým olejom, termickú a antikoróznu stabilitu ako aj výsledné magnetoreologické vlastnosti. Modifikácia grafén oxidových nanočastíc viedla ku kontrolovanej redukcii a tým ku príprave k hybridným materiálom s vodivosťou nastavenou pre elektroreologické suspenzie. Kompozitný elastomér obsahujúci hybridné častice grafén oxidu vykazovali i vynikajúce fotoaktuačné vlastnosti.

Výstupy:

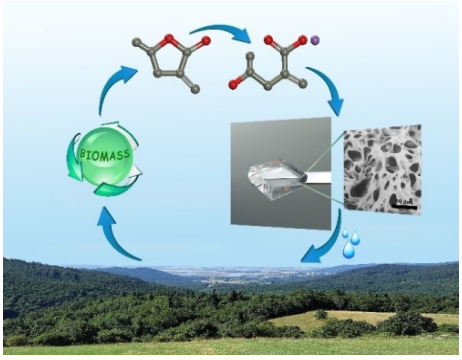
1. CVEK, M. - MRLÍK, M.* - ILČÍKOVÁ, Markéta - MOSNÁČEK, Jaroslav - MUNSTER, L. - PAVLÍNEK, Vl. Synthesis of silicone elastomers containing silyl-based polymer-grafted carbonyl iron particles: An efficient way to improve magnetorheological, damping, and sensing performances. In *Macromolecules*, 2017, vol. 50, no. 5, p. 2189-2200. (5.835 - IF2016). ISSN 0024-9297.
2. OSIČKA, J. - ILČÍKOVÁ, Markéta - MRLIK, M. - MINAŘÍK, A. - PAVLINEK, V. - MOSNÁČEK, Jaroslav*. The impact of polymer grafting from a graphene oxide surface on its compatibility with a PDMS matrix and the light-induced actuation of the composites. In *Polymers : Open Access Polymer Science Journal*, 2017, vol. 9, no. 7, art.no. 264. (3.364 - IF2016). ISSN 2073-4360.
3. MRLÍK, M. - ILČÍKOVÁ, Markéta - PLACHÝ, T. - MOUČKA, R. - PAVLÍNEK, V. - MOSNÁČEK, Jaroslav. Tunable electrorheological performance of silicone oil suspensions based on controllably reduced graphene oxide by surface initiated atom transfer radical polymerization of poly(glycidyl methacrylate). Prijatý do *J. Ind. Eng. Chem.* DOI: https://doi.org/10.1016/j.jiec.2017.08.013 (2018), (IF_{2016} = 4.421)
4. CVEK, M. - MRLIK, M. - ILČÍKOVÁ, Markéta - SEDLÁČIK, M. - MOSNÁČEK, Jaroslav. Magnetorheological elastomers with tailored performance, damping and stability properties containing multifunctional core-shell particles, odoslaný do *Industrial & Engineering Chemistry Research*, Manuscript ID ie-2017-04324y. (IF_{2016} = 2.843)

2) Názov: Superabsorpčný hydrogél pripravený z bioobnoviteľného monoméru. Superabsorbent hydrogel made from bio-sourced monomer.

Ústav polymérov SAV

Mená riešiteľov: Jozef Kollár, Jaroslav Mosnáček, Igor Lacík, Anna Chovancová

Projekty v rámci ktorých sa výsledok dosiahol: v rámci spolupráce s Queen's University Kingston, Kanada



Vodorozpustný 4-hydroxy-4-metyl-2-metylén butanoát sodný (SHMeMB) sa pripravil hydrolýzou γ-metyl-α-metylén-γ-butyrolaktónu (MeMBL), monoméru z obnoviteľných zdrojov. Ten sa následne použil pri kopolymerizácii s akrylamidom (AM) v rôznych mólových pomeroch. Výsledný hydrogél sa vyznačuje superabsorpčnými vlastnosťami so stupňom napučania v ultračistej vode v rozmedzí 6700– 59000 %. Nastaviteľné mechanické vlastnosti hydrogélov významne ovplyvňuje pomer komonomérov a stupeň presietenia. Štúdia bola obohatená taktiež o výpočet rýchlostných konštánt jednotlivých monomérov pomocou *in-situ* NMR a PLP-SEC analýzy.

Výstupy:

1. LUK, S. B. - KOLLÁR, Jozef - CHOVANCOVÁ, Anna - MRLÍK, M. - LACÍK, Igor - MOSNÁČEK, Jaroslav - HUTCHINSON, R. A. Superabsorbent hydrogels made from bio-sourced butyrolactone monomer in aqueous solution.In *Polym. Chem.*, 2017, vol. 8 (39), p. 6039-6049

3) Názov: Kinetika a mechanizmus radikálovej polymerizácie katiónových monomérov vo vodnom prostredí.
Kinetics and mechanism of radical polymerization for cationic monomers in aqueous solutions.

Ústav polymérov SAV

Mená riešiteľov: Anna Chovancová, Eva Hipká, Igor Lacík - zodpovedný riešiteľ

Projekty, v rámci ktorých sa výsledok dosiahol: BASF kontraktová spolupráca (UPo SAV, BASF SE, Queens University Kingston), SAIA štipendium

Poznatky o individuálnych rýchlostných konštantách radikálovej polymerizácie vodorozpustných monomérov vo vodnej fáze a možnosť modelovať polymerizačné systémy sa v poslednom období rozšírili vďaka našej práci o katiónové monoméry. Pre štúdium tejto triedy monomérov pulznou laserovou polymerizáciou v prepojení na gélovú permeačnú chromatografiu, ako aj pre modelovanie polymerizácie partnermi projektu je potrebné presne analyzovať mólovú hmotnosť a disperzitu gélovou permeačnou chromatografiou (GPC). Podarilo sa nám identifikovať podmienky (eluent, kolóny), ktoré sú vhodné pre GPC charakterizáciu takýchto polymérov za použitia absolútneho multi-uhlového rozptylového detektora. V tejto fáze sme sa sústredili na metakrylátové (estery, amidy) katiónové monoméry a aj na monomér s povrchovo aktívnymi vlastnosťami, kde významným poznatkom je závislosť kinetiky a vlastností produktu od koncentrácie protiónov. Tieto poznatky su využité pri dizajnovaní katiónových polymérov pre rôzne aplikácie.

Výstupy:

1. ROONEY, T. R. - CHOVANCOVÁ, Anna - LACÍK, Igor - HUTCHINSON, R. A. Pulsed laser studies of cationic reactive surfactant radical propagation kinetics. In *Polymer : the International Journal for the Science and Technology of Polymers*, 2017, vol. 130, p. 39-49. (3,684 - IF2016). (2017 - Current Contents). ISSN 0032-3861.

2.4. Publikačná činnosť (zoznam je uvedený v prílohe C)

Tabuľka 2e Štatistika vybraných kategórií publikácií

PUBLIKAČNÁ A EDIČNÁ ČINNOSŤ	Počet v r. 2017/ doplnky z r. 2016
1. Vedecké monografie a monografické štúdie vydané v domácich vydavateľstvách (AAB, ABB)	**0 / 0**
2. Vedecké monografie a monografické štúdie vydané v zahraničných vydavateľstvách (AAA, ABA)	**0 / 0**
3. Odborné monografie, vysokoškolské učebnice a učebné texty vydané v domácich vydavateľstvách (BAB, ACB, CAB)	**0 / 0**
4. Odborné monografie a vysokoškolské učebnice a učebné texty vydané v zahraničných vydavateľstvách (BAA, ACA, CAA)	**0 / 0**
5. Kapitoly vo vedeckých monografiách vydaných v domácich vydavateľstvách (ABD)	**0 / 0**
6. Kapitoly vo vedeckých monografiách vydaných v zahraničných vydavateľstvách (ABC)	**3 / 0**
7. Kapitoly v odborných monografiách, vysokoškolských učebniciach a učebných textoch vydaných v domácich vydavateľstvách (BBB, ACD)	**0 / 0**
8. Kapitoly v odborných monografiách, vysokoškolských učebniciach a učebných textoch vydaných v zahraničných vydavateľstvách (BBA, ACC)	**0 / 0**
9. Vedecké práce registrované v Current Contents Connect (ADCA, ADCB, ADDA, ADDB)	**70 / 2**
10. Vedecké práce registrované vo Web of Science Core Collection alebo Scopus (ADMA, ADMB, ADNA, ADNB)	**3 / 0**
11. Vedecké práce v ostatných domácich časopisoch (ADFA, ADFB)	**0 / 0**
12. Vedecké práce v ostatných zahraničných časopisoch (ADEA, ADEB)	**1 / 1**
13. Vedecké práce v domácich recenzovaných zborníkoch (AEDA)	**0 / 0**
14. Vedecké práce v zahraničných recenzovaných zborníkoch (AECA)	**0 / 0**
15. Publikované príspevky na domácich vedeckých konferenciách (AFB, AFD)	**7 / 0**
16. Publikované príspevky na zahraničných vedeckých konferenciách (AFA, AFC)	**7 / 0**
17. Vydané periodiká evidované v CCC, WoS Core Collection, SCOPUS	**0**
18. Ostatné vydané periodiká	**0**
19. Zostavovateľské práce knižného charakteru (FAI)	**3 / 0**
20. Preklady vedeckých a odborných textov (EAJ)	**0 / 0**
21. Heslá v odborných terminologických slovníkoch a encyklopédiách (BDA, BDB)	**0 / 0**
22. Recenzie v časopisoch a zborníkoch (EDI)	**0 / 0**

Evidujú len tie práce zamestnancov a doktorandov, v ktorých je uvedená afiliácia k organizácii

Tabuľka 2f Štatistika vedeckých prác podľa kvartilu vedeckého časopisu

Kvartil vedeckého časopisu	**Q1**	**Q2**	**Q3**	**Q4**	**Spolu**
Podľa IF z r. 2016 (zdroj JCR) *Počet článkov / doplnky 2015*	37 / 1	20 / 0	9 / 1	6 / 0	72 / 2
Podľa SJR z r. 2016 (zdroj Scimago) *Počet článkov / doplnky 2015*	50 / 1	16 / 0	7 / 1	0 / 0	73 / 2

Tabuľka 2g Ohlasy

OHLASY	**Počet v r. 2016/ doplnky z r. 2015**
Citácie vo WOS (1.1, 2.1)	1820 / 0
Citácie v SCOPUS (1.2, 2.2)	293 / 3
Citácie v iných citačných indexoch a databázach (9, 10, 3.2, 4.2)	0 / 0
Citácie v publikáciách neregistrovaných v citačných indexoch (3, 4, 3.1, 4.1)	4 / 0
Recenzie na práce autorov z organizácie (5, 6, 7, 8)	0 / 0

2.5. Aktívna účasť na vedeckých podujatiach

Tabuľka 2h Vedecké podujatia

Prednášky a vývesky na medzinárodných vedeckých podujatiach	103
Prednášky a vývesky na domácich vedeckých podujatiach	30

2.6. Vyžiadané prednášky

2.6.1. Vyžiadané prednášky na medzinárodných vedeckých podujatiach

1. **BEREK, Dušan**. Molecular characterization of block copolymers by liquid chromatography. In *Journal of Chromatography and Separation Techniques : an open access journal*, 2017, vol. 8, iss. 4 Suppl., p. 22. ISSN 2157-7064.
2. **BEREK, Dušan**. Evaluation of high-performance liquid chromatography columns retentivity with the help of macromolecular probes. In *Journal of Chromatography and Separation Techniques : an open access journal*, 2017, vol. 8, iss. 5 Suppl., p. 26. ISSN 2157-7064.
3. **BEREK, Dušan**. Recent progress in liquid chromatography of synthetic polymers. In *The 5th International Conference on Catalysis : Engii conference august series : conference guide*. - Guilin, China : Scientidic Research Publishing, 2017, p. 4-5.
4. **BEREK, Dušan**. Retention mechanisms in liquid chromatography of non-charged synthetic polymers. In *23rd International Symposium on Separation Sciences : ISSS 2017 : September 19-22, 2017, Vienna, Austria*. - Vienn, Austria : TU Wien, 2017, p. 77. ISBN 978-3-9504017-7-6.
5. **BEREK, Dušan** - *NOVÁK, Ivan*. Functional composites based on microporous carbon fibers with deposited nanoparticles. In *25 th POLYCHAR 2017 : World Forum on Advanced Materials : abstracts*. - Kuala Lumpur, Malaysia : Institut Kimia Malaysia, 2017, non.p. Dostupné na internete: .
6. **BEREK, Dušan**. Retention mechanisms in liquid chromatography of uncharged synthetic polymers. In *HPLC 2017 Prague: 45th International Symposium on High Performance Liquid Phase Separations and Related Techniques: abstract book*. - Prague, Czech Republic, 2017, p. 77. Dostupné na internete: .
7. **KRONEK, Juraj.** Biomedical polymers based on functional 2-oxazolines. In *Brochure of the International Workshop on Polymer Science and Polymeric Materials*. - Bratislava, Budapest, Zabrze :

Centre of Polymer and Carbon Materials Polish Academy of Sciences, Research Centre for Natural Sciences Hungarian Academy of Sciences, Polymer Institute of the Slovak Academy of Sciences, 2017, p. 13. ISBN 978-80-89841-06-6.

8. **MARKOVIĆ, Zoran M**. Biomedical application of carbon nanomaterials and graphene/polymer nanocomposites. In *Bypos: 7th Bratislava Young Polymer Scientists Wokshop* : workshop book. - Bratislava : Young Scientist Council of Polymer Institute SAS, 2017, p. 21. ISBN 978-80-89841-05-9. Typ: **AFF**
9. **MARKOVIĆ, Zoran M**. Biomedical applications of carbon and graphene quantum dots. In *Graphene-based components and flexible electronic/sensing devices*. - Novi Sad, Serbia : University of Novi Sad, 2017, non.p. Dostupné na internete: . Typ: AFE
10. **MIČUŠÍK, Matej** - KULIČEK, Jaroslav - GEMEINER, P. - MIKULA, M. - KIM, S.Y. - OMASTOVÁ, Mária. Polypyrrole based composites for solar cell application. In *Polymers and Organic Materials for Electronics and Photonics: Science for Applications* : book of abstracts and programme. - Prague, Czech Republic : The Institute of Macromolecular Chemistry, Czech Academy of Sciences, 2017, p. 58. ISBN 978-80-85009-88-0. Typ: AFE
11. **MOSNÁČEK, Jaroslav** - ILČÍKOVÁ, Markéta - KUNDYS, Anna - ECKSTEIN ANDICSOVÁ, Anita - BORSKÁ, Katarína - MORAVČÍKOVÁ, Daniela. Copper mediated photochemically induced ATRP. In *Bypos: 7th Bratislava Young Polymer Scientists Wokshop : workshop book*. - Bratislava: Young Scientist Council of Polymer Institute SAS, 2017, p. 23. ISBN 978-80-89841-05-9. Typ: AFF
12. **OMASTOVÁ, Mária** - BUGÁROVÁ, Nikola - ŠPITÁLSKY, Zdenko - KONERACKÁ, M. - ZAŤOVIČOVÁ, M. - ŠIFFALOVIČ, P. Modified graphene oxide in biosensor application. In *ICAE 2017: The 4th International Conference on Advanced Electromaterials* : abstract e-book. - Jeju, Korea: The Korean Institute of Electrical and Electronic Material Engineers, 2017, s17-0327. Dostupné na internete: . Typ: AFE
13. **PEPTU, Cristian** - Savin, C. *Preparation of porous polymer gels through photoinitiated thiol-ene coupling.* The International Conference on Functional Materials and Biomaterials (CFMB2017) November. 17-19, 2017, in Yichang, Hubei, China.(proceedings will be published in AIP Conference Proceedings (ISSN: 0094-243X, E-ISSN: 1551-7616)
14. TREĽOVÁ, Dušana - RÁZGA, Filip - KRONEKOVÁ, Zuzana - NÉMETHOVÁ, Veronika - UHELSKÁ, Lucia - RAUS, Vladimír - MAZANCOVÁ, Petra - FRAŇO, Milan - HEYDARI, Abolfazl - KLEŠČÍKOVÁ, Lucia - ROKSTAD, Anne Mari - MARCHESE, Enza - MCGARRIGLE, James - OBERHOLZER, José - **LACÍK, Igor**. Polyelectrolyte microcapsules: A bridge to improved diabetes treatment. In *DVSPM 2017 : Danube Vltava Sava Polymer Meeting : book of abstracts*. - Vienna, Austria : Institute of Applied Synthetic Chemistry TU Wien, 2017, abstract no. IL-21. ISBN 978-3-9504017-6-9.

2.6.2. Vyžiadané prednášky na domácich vedeckých podujatiach

1. **CHODÁK, Ivan** - OMASTOVÁ, Mária. Výskum na Ústave polymérov SAV zameraný na potenciálne aplikácie. 7. Ročník seminárov z cyklu Trendy v plastikárskom priemysle, Veľká Lomnica 27.-28.9.2017
2. **KRONEKOVÁ, Zuzana.** Kvapka krvi "zo srdca pre život", 5.12.2017, Ústav pre výskum srdca SAV, Bratislava
3. **LACÍK, Igor.** Kontrola hladiny glukózy transplantovanými enkapsulovanými ostrovčekmi: súčasná situácia, 5. jún 2017, DFNsP, Bratislava
4. **MARKOVIĆ, Zoran M.** Biomedical application of carbon quantum dots. In ChemZi : Slovenský časopis o chémii pre chemické vzdelávanie, výskum a priemysel, 2017, roč. 13, č. 1, s. 85. ISSN 1336-7242. Typ: AFH
5. **MIČUŠÍK, Matej** - CHATZIMANOLIS, Ch. - *TABAČIAROVÁ, Jana* - KOLLÁR, Jozef - KYRITSIS, A. - PISSIS, P. - PIONTECK, J. - OMASTOVÁ, Mária. Gas sensors based on elastomer/carbon nanotubes composites. In PMA 2017 & SRC 2017: International Conference on Polymeric Materials in Automotive: 23rd Slovak Rubber Conference: book of proceedings. Techn.red. D. Jochec-Mošková. - Bratislava, Slovakia : Slovak University of Technology, Faculty of Chemical and Food Technology & Polymer Institute of SAS, 2017, p. 79-80. ISBN 978-80-89841-04-2.(PMA 2017 & SRC 2017 :

International Conference on Polymeric Materials in Automotive : Slovak Rubber Conference). Typ: AFD

6. **RÁZGA, Filip**. Mikroenkapsulácia pankreatických ostrovčekov, 20.06.2017, DIADOR, Prešov

2.6.3. Vyžiadané prednášky na významných vedeckých inštitúciách

Ak boli príspevky publikované, sú súčasťou prílohy C, kategória (AFC, AFD, AFE, AFF, AFG, AFH)

1. **LACÍK, Igor** - CHOVANCOVÁ, Anna. Charges, polymers and radical polymerization. 19.-21.06.2017, BASF discussion meeting, Smolenice, Slovakia
2. **LACÍK, Igor**. Polymer microcapsules for diabetes treatment. 10.10.2017, seminar - Ústav polymerů Vysoké školy chemicko-technologické v Praze, ČR
3. **LACÍK, Igor**. Multicomponent microcapsules for allogeneic islet transplantation in a comprehensive, preclinical non-human primate model. 9.-10.05.2017, JEC JDRF meeting, New York, NY, USA
4. **LACÍK, Igor**. New generation PMCG multicomponent microcapsule with tailored biointerface to avoid immune response after transplantation.7.-9.11.2017, JEC JDRF meeting, Long Beach, CA, USA
5. **LACÍK, Igor.** Kontrola hladiny glukózy transplantovanými enkapsulovanými ostrovčekmi: súčasná situácia. Prednáška pre lekárov, 5.06.2017, DFNsP Bratislava, Kramáre
6. **MOSNÁČEK Jaroslav**. Photochemically induced atom transfer radical polymerization – Photo ATRP, 23.2.2017, Ústav Makromolekulární chemie AV ČR, Praha, ČR
7. **MOSNÁČEK Jaroslav**. Polymers from renewable unsaturated gamma-butyrolactones, 26.04.2017, Centre of Molecular and Macromolecular Studies PAS, Lodz, Poland
8. **MOSNÁČEK Jaroslav.** Polymers from renewable alpha-methylene-gamma-butyrolactone, 11.05.2017, National Chung Hsing University, Taichung City, Taiwan
9. **MOSNÁČEK Jaroslav**. Atom transfer radical polymerization (ATRP): Development of photoATRP and hybrid materials prepared by ATRP, 19.10.2017 Research Centre for Natural Sciences HAS, Budapest, Hungary
10. **PEPTU Cristian** Mass spectrometry characterization of covalent conjugates between cyclodextrins and aliphatic oligoesters 2 hours lecture, 19.10.2017, Wolverhampton School of Science, Faculty of Science and Engineering, University of Wolverhampton, UK.
11. **ŠIŠKOVÁ, Alena** - KOZMA, E. - GALEOTTI, F. - OPÁLEK, A. - ECKSTEIN ANDICSOVÁ, Anita, Electrospinning and medical applications of electrospun layers, 22.11.2017, Polymer Chemistry Research Group, Institute of Materials and Environmental Chemistry, Research Centre for Natural Sciences, HASBudapest, Hungary

2.7. Patentová a licenčná činnosť na Slovensku a v zahraničí v roku 2017

2.7.1. Vynálezy, na ktoré bol udelený patent

Na Slovensku - počet patentov: 3

Číslo PV: Patent No 2398772(Čína)
Mená autorov: CHODÁK, Ivan - ALEXY, P. - BAKOŠ, D. - BUGAJ, P. - PAVLAČKOVÁ, M. - TOMANOVÁ, K. - BENOVIČ, F. - PLAVEC, R. - MIHALÍK, M. – BOTOŠOVÁ, M
Názov vynálezu: Biologically degradable polymeric composition with high deformability
Majiteľ / spolumajiteľ: Ústav polymérov SAV

Číslo PV: Patentový spis č. 288507
Mená autorov: BEREK, Dušan - NOVÁK, Ivan
Názov vynálezu: Spôsob výroby nanopórovitého vláknitého uhlíka z celulózových prekurzorov
Majiteľ / spolumajiteľ: Ústav polymérov SAV

Číslo PV: Int. Publication Number: WO 2017/065696

Mená autorov: RÁZGA, Filip - NÉMETHOVÁ Veronika
Názov vynálezu: A method for altering the functional status of mRNA allowing its selective and specific recognition;
Majiteľ / spolumajiteľ: Ústav polymérov SAV

2.7.2. Prihlásené vynálezy

Na Slovensku - počet patentov: 3

Číslo PV: Patent. prihláška č. 50017-2017, marec 2017
Mená autorov: ŠPITÁLSKY. Zdenko – MARKOVIC, Zoran
Názov vynálezu: Spôsob výroby nanokompozitného materiálu s antibakteriálnymi vlastnosťami, takýto materiál a jeho použitie.
Majiteľ / spolumajiteľ:

Číslo PV: Úžitkový vzor č. 255-2017, november 2017
Mená autorov: ŠPITÁLSKY, Zdenko – KOVÁČOVÁ, Mária - ĎURIŠ, V. – VYSOPAL, M. – SVOBODA, P.
Názov vynálezu: Polymérne kompozity pre 3D tlač.
Majiteľ / spolumajiteľ:

Číslo PV: Patentová prihláška č. 117-2017, 3. dátum podania
Mená autorov: ŠVAJDLENKOVÁ Helena - ŠAUŠA, O.
Názov vynálezu: Komôrka na štúdium fotopolymerizácie metódou pozitrónovej anihilácie.
Majiteľ / spolumajiteľ: Ústav polymérov SAV; Dúbravská cesta 9, 845 41 Bratislava 45

2.7.3. Predané licencie

2.7.4. Realizované patenty

Finančný prínos pre organizáciu SAV v roku 2017 a súčet za predošlé roky sa neuvádzajú, ak je zverejnenie v rozpore so zmluvou súvisiacou s realizáciou patentu.

2.8. Účasť expertov na hodnotení národných projektov (APVV, VEGA a iných)

Tabuľka 2i Experti hodnotiaci národné projekty

Meno pracovníka	Typ programu/projektu/výzvy	Počet hodnotených projektov
DANKO Martin	MAD	1
DANKO Martin	VEGA	1
ECKSTEIN Anita	VEGA	1
CHODÁK Ivan	APVV	1
LACÍK Igor	APVV granty VV-2016 - spravodajca žiadosti o grant	12
MOSNÁČEK Jaroslav	MAD projekt	1
NOVÁK Igor	APVV	2
NOVÁK Igor	VEGA	1
PEPTU Kristián	VEGA	1
Rychlý Jozef	VEGA	1

2.9. Účasť na spracovaní hesiel do encyklopédie Beliana

Počet autorov hesiel: 1

2.10. Recenzovanie publikácií a príspevkov vo vedeckých časopisoch

Tabuľka 2j Počet recenzovaných monografií, článkov, zborníkov

Meno pracovníka	Knižné monografie		Príspevky v časopisoch			Zborníky	
	Domáce	Zahra-ničné	WoS, SCOPUS	Iné databázy	Ostatné	Domáce	Zahra-ničné
BARTOŠ Josef	0	0	5	0	0	0	0
BENKOVÁ Zuzana	0	0	4	0	0	0	0
CIFRA Peter	0	0	2	0	0	0	0
DANKO Martin	0	0	12	0	0	0	0
ECKSTEIN Anita	0	0	1	0	0	0	0
HEZDARI Abolfazl	0	0	6	0	0	0	0
CHMELA Štefan	0	0	1	0	0	0	0
CHODÁK Ivan	0	0	8	0	0	0	0
KRONEK Juraj	0	0	6	0	0	0	0
KRONEKOVÁ Zuzana	0	0	1	0	0	0	0
LACÍK Igor	0	0	2	0	0	0	0
MIČUŠÍK Matej	0	0	5	0	0	0	0
MOSNÁČEK Jaroslav	0	0	9	0	0	0	0
NOVÁK Igor	0	0	10	0	0	0	0
OMASTOVÁ Mária	0	0	3	0	0	0	0
RYCHLÝ Jozef	0	0	2	0	0	0	0
ŠIŠKOVÁ Alena	0	0	2	0	0	0	0
ŠPITÁLSKY Zdenko	0	0	2	0	0	0	0
ŠVAJDLENKOVÁ Helena	0	0	1	0	0	0	0
Spolu	**0**	**0**	**83**	**0**	**0**	**0**	**0**

2.11. Iné informácie k vedeckej činnosti.

Hodnotenie organizačných útvarov ústavu Vedeckou radou sa už tradične uskutočnilo formou dvojdňového kolokvia, ktoré sa konalo v polovici decembra 2017 v zasadačke Ústavu polymérov. Kolokvium bolo organizované a vedené Vedeckou radou ústavu a pre každé oddelenie bol určený hodnotiteľ z členov VR. Podkladom pre hodnotenie oddelení bol písomný materiál štrukturovaný podľa zásad definovaných Vedeckou radou. Cieľom hodnotenia bolo získať komplexný prehľad jednak o činnosti jednotlivých oddelení a zároveň o príspevku vedeckých a vedeckotechnických pracovníkov do výstupov oddelení v kontexte posledných troch rokov. Pri vyhodnotení

predchádzajúceho kolokvia, začiatkom roka 2017, sa dospelo k názoru, že hodnotenie je postavené najmä na štatistických údajoch a nie úplne spĺňa účel prezentovania kvalitného výskumu jednotlivých oddelení. Preto koncoročné kolokvium sa nieslo v zmysle jeho zatraktívnenia pre pracovníkov ústavu – v rámci kolokvia sa po krátkej úvodnej prezentácii vedúceho oddelenia o aktivitách na oddelení, konali len prezentácie vedeckých pracovníkov a samotné hodnotenie oddelenia sa uskutočnilo len v rámci zasadnutia VR. Zavedené zmeny boli prínosom a v podobnom duchu sa pravdepodobne uskutoční i nasledujúce kolovium koncom roka 2018.

Zameranie ústavu pokračuje v tradičných témach popri rozvíjaní nových tém hlavne v oblasti bioaplikácií polymérov a nanotechnológiách. Tematický profil pracoviska je v štyroch základných oblastiach reflektujúcich tematiku štyroch oddelení: syntéza a modifikácia polymérov, biomateriály a bioaplikácie, polymérne kompozity a modelovanie. Kvantitatívne a kvalitatívne vedecké, projektové a popularizačné výstupy − počty publikácií, citácií, projektov a projektových spoluprác, popularizačných článkov, popularizačných akcií a vystúpení v médiách, ako aj iné ukazovateľe sú i za rok 2017 uspokojivé. Doleuvedená Tabuľka dokumentuje vývoj počtu publikácií a citácií za posledných 5 rokov. Treba uviesť však, že časť výstupov je stále produkovaná pracovníkmi nad 65 rokov vrátane emeritných pracovníkov. V budúcnosti by sa mali formovať ďalšie vedúce osobnosti tímov z mladšej generácie vedeckých pracovníkov, ktorí by mali postupne významnejšie prispievať k počtu publikácií a zastúpiť odchádzajúcu generáciu starších vedeckých pracovníkov.

Rok	**CC publikácie**	**Monografie a kapitoly v knihách**	**Citácie**
2013	48	2	1296
2014	65	2	1664
2015	65	3	1817
2016	70	7	1700
2017	71	3	2114

Vedecká rada organizuje semináre vedeckých pracovníkov ústavu a pravidlom sú i vedecké prednášky zahraničných hostí organizované ad-hoc v priebehu ich návštev ústavu prevažne v rámci projektovej spolupráce. Pokračoval aj cyklus pozvaných prednášok zahraničných vedeckých osobností; aktívnejší prístup v organizovaní tohto cyklu sa plánuje v r. 2018.
V roku 2017 sa už tradične uskutočnilo i hodnotenie mladých vedeckých pracovníkov, ktorým končila v roku 2017 pracovná zmluva. Základom pre hodnotenie bol vyplnený formulár s doterajšími výstupmi a vedecko-organizačnými aktivitami a krátka prezentácia doterajších najvýznamnejších výsledkov a plánovaného budúceho zamerania. Cieľom hodnotenia je selekcia mladých vedeckých pracovníkov na základe ich vedeckých výsledkov a schopností samostatne pracovať a rozvíjať výskum. Malo by viesť k zamestnávaniu kvalitnejších vedeckých pracovníkov, ktorí budú schopní rozvíjať výskum na ÚPo SAV a zvyšovať jeho konkurencieschopnosť a povedomie doma i v zahraničí.

3. Doktorandské štúdium, iná pedagogická činnosť a budovanie ľudských zdrojov pre vedu a techniku

3.1. Údaje o doktorandskom štúdiu

Tabuľka 3a Počet doktorandov v roku 2017

Forma	Počet k 31.12.2017						Počet ukončených doktorantúr v r. 2017					
	Doktorandi						Ukončenie z dôvodov					
	celkový počet		z toho novoprijatí		po skúške		ukončenie úspešnou obhajobou		predčasné ukončenie		neúspešné ukončenie	
	M	Ž	M	Ž	M	Ž	M	Ž	M	Ž	M	Ž
Denná zo zdrojov SAV	4	9	3	1	0	0	2	1	0	0	0	0
Denná z iných zdrojov	0	0	0	0	0	0	0	0	0	0	0	0
Externá	0	1	0	0	0	0	0	0	0	0	0	0
Spolu	4	10	3	1	0	0	2	1	0	0	0	0
Súhrn	14		4		0		3		0		0	

Uvádzajte len doktorandov organizácie ako externej vzdelávacej inštitúcie

3.2. Zmena formy doktorandského štúdia

Tabuľka 3b Počty preradení z dennej formy na externú a z externej na dennú

Pôvodná forma	Denná z prostriedkov SAV	Denná z prostriedkov SAV	Denná z iných zdrojov	Denná z iných zdrojov	Externá	Externá
Nová forma	**Denná z iných zdrojov**	**Externá**	**Denná z prostriedkov SAV**	**Externá**	**Denná z prostriedkov SAV**	**Denná z iných zdrojov**
Počet	0	0	0	0	0	0

3.3. Zoznam doktorandov, ktorí ukončili doktorandské štúdium úspešnou obhajobou

Tabuľka 3c Menný zoznam ukončených doktorandov v roku 2017 úspešnou obhajobou

Meno doktoranda	Forma DŠ	Mesiac, rok nástupu na DŠ	Mesiac, rok obhajoby	Číslo a názov študijného odboru	Meno a organizácia školiteľa	Fakulta udeľujúca vedeckú hodnosť
Ing. Jaroslav KULIČEK	interné štúdium hradené z prostriedkov SAV	9 / 2013	8 / 2017	4.1.19 makromolekulová chémia	Ing. Mária Omastová DrSc., Ústav polymérov SAV	Fakulta chemickej a potravinárskej technológie STU
Mgr. Jozef PRACHÁR	interné štúdium hradené z prostriedkov SAV	9 / 2012	8 / 2017	4.1.19 makromolekulová chémia	Ing. Igor Novák PhD., Ústav polymérov SAV	Fakulta chemickej a potravinárskej technológie STU

Mgr. Petra ŠRÁMKOVÁ	interné štúdium hradené z prostriedkov SAV	9 / 2013	8 / 2017	4.1.19 makromolekulová chémia	Mgr. Juraj Kronek PhD., Ústav polymérov SAV	Fakulta chemickej a potravinárskej technológie STU

Zoznam interných a externých doktorandov je uvedený v prílohe A.

3.4. Medzinárodné doktorandské štúdium

Tabuľka 3d Počet študentov v medzinárodných programoch doktorandského štúdia

Cotutelle	Co-direction	Iné	Zahraniční doktorandi
0	0	0	2

3.5. Zoznam akreditovaných študijných odborov s uvedením VŠ

Tabuľka 3e Zoznam akreditovaných študijných odborov s uvedením univerzity/vysokej školy a fakulty, kde sa doktorandský študijný program uskutočňuje

Názov študijného odboru (ŠO)	**Číslo ŠO**	**Doktorandské štúdium uskutočňované na** (univerzita/vysoká škola a fakulta)
fyzikálna chémia	4.1.18	Prírodovedecká fakulta UK, Fakulta chemickej a potravinárskej technológie STU
makromolekulová chémia	4.1.19	Fakulta chemickej a potravinárskej technológie STU
technológia makromolekulových látok	5.2.21	Fakulta chemickej a potravinárskej technológie STU

Tabuľka 3f Účasť na pedagogickom procese

Menný prehľad pracovníkov, ktorí boli menovaní do spoločných odborových komisií pre doktorandské štúdium	**Menný prehľad pracovníkov, ktorí pôsobili ako členovia vedeckých rád univerzít, správnych rád univerzít a fakúlt**	**Menný prehľad pracovníkov, ktorí získali vyššiu vedeckú, pedagogickú hodnosť alebo vyšší kvalifikačný stupeň**
Doc. Ing. Dušan Berek, DrSc. (analytická chémia)	Prof., RNDr. Ignác Capek, DrSc. (Fakulta priemyselných technológií TnUAD v Púchove)	RNDr. Dmitrij Bondarev, PhD. (IIa)
Prof. Ing. Tomáš Bleha, DrSc. (fyzikálna chémia – UK)	Ing. Igor Lacík, DrSc. (Fakulta chemickej a potravinárskej technológie STU)	Mgr. Jaroslav Mosnáček, DrSc. (I)
Prof. Ing. Tomáš Bleha, DrSc. (fyzikálna chémia – FCHPT)	Ing. Igor Lacík, DrSc. (Univerzita T. Bati, Zlín, Česká Republika)	Ing. Jaroslav Kuliček, PhD. (PhD., Fakulta chemickej a potravinárskej technológie STU)
RNDr. Peter Cifra, DrSc. (fyzikálna chémia)	Mgr. Jaroslav Mosnáček, DrSc. (Centre of Excellence for advanced materials application (CEMEA), Slove)	Mgr. Jozef Prachár (PhD., Fakulta chemickej a potravinárskej technológie STU)
RNDr. Peter Cifra, DrSc. (makromolekulová chémia)	Ing. Mária Omastová, DrSc. (Fakulta prírodných vied UCM)	Mgr. Petra Šrámková, PhD. (PhD., Fakulta chemickej a potravinárskej technológie STU)

Mgr. Martin Danko, PhD. (makromolekulová chémia)		
Prof. Ing. Ivan Chodák, DrSc. (odbor v zahraničí)		
Ing. Igor Lacík, DrSc. (makromolekulová chémia)		
Ing. Matej Mičušík, PhD. (technológia makromolekulových látok)		
Mgr. Jaroslav Mosnáček, DrSc. (makromolekulová chémia)		
Ing. Igor Novák, PhD. (odbor v zahraničí)		
Ing. Mária Omastová, DrSc. (fyzikálna chémia)		
Ing. Mária Omastová, DrSc. (makromolekulová chémia)		
Mgr. Zdenko Špitálsky, PhD. (technológia makromolekulových látok)		

3.6. Údaje o pedagogickej činnosti

Tabuľka 3g Prednášky a cvičenia vedené v roku 2017

PEDAGOGICKÁ ČINNOSŤ	**Prednášky**		**Cvičenia a semináre**		**Vedenie bakalárskych a diplomových prác**
	doma	**v zahraničí**	**doma**	**v zahraničí**	
Počet prednášateľov alebo vedúcich cvičení	6	3	5	4	2
Celkový počet hodín v r. 2017	34	144	290	920	160

Prehľad prednášateľov predmetov a vedúcich cvičení, s uvedením názvu predmetu, úväzku, katedry, fakulty, univerzity/vysokej školy je uvedený v prílohe D.

Tabuľka 3h Aktivity pracovníkov na VŠ

1.	**Počet pracovníkov, ktorí pôsobili ako vedúci alebo konzultanti diplomových a bakalárskych prác**	5
2.	**Počet vedených alebo konzultovaných diplomových a bakalárskych prác**	6
3.	**Počet pracovníkov, ktorí pôsobili ako školitelia doktorandov (PhD.)**	12
4.	**Počet školených doktorandov (aj pre iné inštitúcie)**	15
5.	**Počet oponovaných dizertačných a habilitačných prác**	11
6.	**Počet pracovníkov, ktorí oponovali dizertačné a habilitačné práce**	6
7.	**Počet pracovníkov, ktorí pôsobili ako členovia komisií pre obhajoby DrSc. prác**	3
8.	**Počet pracovníkov, ktorí pôsobili ako členovia komisií pre obhajoby PhD.**	10

	prác	
9.	**Počet pracovníkov, ktorí pôsobili ako členovia komisií, resp. oponenti v inauguračnom alebo habilitačnom konaní na vysokých školách**	1

3.7. Iné dôležité informácie k pedagogickej činnosti

Vedeckí pracovníci Ústavu polymérov sa aktívne podieľajú aj na výchove študentov a doktorandov. V roku 2017 pracovníci ústavu pôsobili pedagogicky ako prednášatelia semestrálnych prednášok a seminárov pre študentov na Prírodovedeckej fakulte UK, Fakulte chemickej a potravinárskej technológie STU v Bratislave ale i na zahraničných univerzitách - Univerzite J. Dlugosza, Czestochowa, Poľsko a Kyushu University, Japonsko.

Do riešenia parciálnych vedeckých problémov sa v pozícii VPS zapojili aj študenti bakalárskeho stupňa, čo je dobrým predpokladom pre ich následné získanie na PhD štúdium. Vedecká výchova doktorandov pokračovala úspešne aj v poslednom roku. Pracovisko je akreditované v dvoch odboroch - Makromolekulová chémia, Technológia makromolekulových látok - na Fakulte chemickej a potravinárskej technológie STU v Bratislave a v odbore Fyzikálna chémia na Prírodovedckej fakulte Univerzity Komenského. V roku 2017 sme získali štyroch nových doktorandov zo slovenských univerzít.

Vedeckí pracovníci ústavu prispievajú k výchove doktorandov aj ako prednášatelia v prednáškových kurzoch a ako vedúci dizertačných prác doktorandov. V rámci Vedeckej rady ÚPo SAV sa už dlhodobejšie diskutuje o skvalitnení prípravy doktorandov, kde sa predpokladá zorganizovanie ďalších odborných prednášok a prehĺbenie vedomostí zapojením pracovníkov ústavu a pozvaných hostí ako prednášateľov do špeciálnych kurzov pre doktorandov. Vedenie ústavu a Vedecká rada kladú veľký dôraz na kvalitnú prípravu PhD študentov, ktorej súčasťou sú každoročné hodnotenia doktorandov, ktoré sa v roku 2017 konalo v septembri, pričom doktorandi prezentovali výsledky dosiahnuté v priebehu ukončeného akademického roka 2016/2017. Motiváciou v tomto štádiu prípravy je vyhodnotenie najlepších doktorandov za posledný akademický rok, ktorí získajú pravidelnú mesačnú finančnú prémiu k štipendiu. Doktorandské štúdium obhajobou dizertačnej práce ukončili traja doktorandi.

V roku 2017 sme opätovne zorganizovali pre širokú verejnosť a pre študentov stredných a vysokých škôl Deň otvorených dverí, ktorý sa ako každý rok stretol s veľkým záujmom. Počas tohto podujatia bola zriadená Vedecká kaviareň, v ktorej stredoškoláci a vysokoškoláci diskutovali s kolegami z nášho ústavu o rôznych témach týkajúcich sa polymérov a o samotných polyméroch a pracovisku sa návštevníci dozvedeli viac pri návštevách oddelení ústavu a malých prezentáciách vo vstupnej hale.

Okrem uvedených aktivít vedeckí pracovníci Ústavu polymérov viedli odbornú prax talentovaných študentov gymnázií s cieľom podchytiť a vychovať potenciálnych záujemcov o štúdium makromolekulovej chémie.

4. Medzinárodná vedecká spolupráca

4.1. Medzinárodné vedecké podujatia

4.1.1. Medzinárodné vedecké podujatia, ktoré organizácia SAV organizovala v roku 2017 alebo sa na ich organizácii podieľala, s vyhodnotením vedeckého a spoločenského prínosu podujatia

VII. medzinárodná konferencia o polymérnych materiáloch v automobilovom priemysle PMA 2017, Konferenčné centrum Lindner Hotel - Bratislava, Slovenská republika, 98 účastníkov, 29.05.-31.05.2017

V dňoch 29.-31. mája 2017 sa uskutočnil v Bratislave už 7. ročník medzinárodnej konferencie „Polymeric Materials in Automotive – PMA 2017“ spolu s 23. ročníkom medzinárodnej gumárskej konferencie „Slovak Rubber Conference SRC 2017“.

Hlavným cieľom konferencie bolo prezentovať dosiahnuté výsledky výskumu a vývoja na báze plastov a elastomérov a upriamiť pozornosť na možnosti a potenciál výskumu a vývoja na Slovensku v oblasti polymérnych materiálov aplikovaných v automobilovom priemysle. Programovo bola konferencia rozdelená do niekoľkých blokov - úvodného a záverečného bloku plenárnych prednášok a ďalších blokov prednášok prebiehajúcich paralelne v dvoch sekciách.

V úvodnom bloku programu konferencie odzneli prednášky zástupcov usporiadateľských organizácií - dekana Fakulty chemickej a potravinárskej technológie STU v Bratislave a riaditeľa Ústavu polymérov SAV približujúce orientáciu hlavne materiálového výskumu na oboch pracoviskách.

Prednáška viceprezidenta Zväzu automobilového priemyslu na Slovensku naznačila postavenie a trendy rozvoja automobilového priemyslu vo svete, v rámci Európskej únie a na Slovensku najmä z hľadiska významu tohto odvetvia pre hospodársky rast Slovenska. Úvodný blok ukončila plenárna prednáška zástupcu firmy Volkswagen Slovakia Bratislava týkajúca sa technických trendov v automobilovom priemysle a odhadov budúceho vývoja najmä v oblasti výroby a vybavenia osobných vozidiel vrátane vozidiel bez vodiča.

S veľkým záujmom sa stretli plenárne prednášky prof. Nakajima z Tokijského technologického inštitútu a zástupcu firmy Jeol Europe SAS, ktorí predstavili nové možnosti využitia mikroskopických metód pri štúdia štruktúry polymérnych materiálov.

Oživením odborného programu konferencie boli preyentácie zástupcov Európskej patentovej kancelárie v prvý a záverečný deň konferencie, ktorí ponúkli účastníkom pohľad uplatnenia sa polymérnych materiálov v automobiloch z hľadiska retrospektívy, ako aj perspektív polymérnych materiálov v budúcnosti na základe vývoja v oblasti patentovej politiky. So zvláštnou pozornosťou sa stretol návrh inovatívnych aplikácii špeciálnych aditív pre materiály v automobiloch, ktoré prezentovala zástupkyňa firmy Miliken Europe BVBA.

So zameraním činnosti v oblasti skúšobníctva, materiálového a výrobkového výskumu v rámci Technologického centra v Púchove ako súčasti koncernu Continental oboznámil účastníkov konferencie zástupca Continental Matador Rubber.

Veľkému záujmu sa tešila aj posterová sekcia, v ktorej autori na 21 posteroch predstavili výsledky svojho výskumu a vývoja v oblasti zmesných a kompozitných materiálov pre aplikáciu v automobiloch, nových metód a postupov analýzy polymérov, možnostiach modifikácie ich vlastností, biopolyméroch a kompozitoch využívajúcich ako zložky biodegradovateľné polyméry, nových technologických aspektoch prípravy zmesí na báze kaučukov, ako aj nových metódach a technológiách spracovania polymérov.

Druhý deň rokovania bol venovaný zvlášť prednáškam z oblasti gumárskych surovín a výrobkov a oblasti plastov s oddeleným rokovaním v:

sekcii plastov – Plastics in Automotive - PMA 2017

sekcii gumárenských surovín a výrobkov – Slovak Rubber Conference 2017.
V rámci každej sekcie boli prednášky venované štyrom okruhom problémov. Popri nových surovinách a nanomateriáloch, polyméroch z obnoviteľných surovín a ich recyklácii sa pozornosť venovala aj postupom testovania vlastností a opotrebenia výrobkov z polymérov. Veľmi dôležitými aplikáciami polymérov, ktorých výsledky výskumu a vývoja boli prezentované aj v sekcii plastov aj elastomérnych produktov boli polyméry vo forme senzorov a hybridných materiálov.
V záverečnom plenárnom bloku prof. Giese z DIK v Hannoveri priblížil problematiku mechanizmov a charakterizácie procesu degradácie, ako aj možnosti zvýšenia stability peroxidmi sieťovaných elastomérnych systémov. Téme termooxidačnej stability polymérov z hľadiska metodického hodnotenia s využitím termických metód sa venoval prof. Šimon. Blok prednášok venovaný stabilizácii polymérov pre automobilový priemysel z pohľadu súčasného stavu, ako aj budúcich perspektív uzavrela prednáška zástupcu CEITEC z Brna. Na záver rokovania konferencie prof. Schuster prezentoval možné aplikácie vrstevnatých silikátov ako základu pre nové typy elastomérnych materiálov.
V rámci konferencie odznelo celkovo 5 plenárnych prednášok, 16 kľúčových prednášok a 18 krátkych prednášok v oboch programových sekciách. Program konferencie bol doplnený prezentáciou 21 posterov a celkový rámec dopĺňala aj prezentácia firiem vyrábajúcich laboratórnu techniku a zariadenia na testovanie vlastností polymérnych materiálov.
Spoločným úsilím organizátorov z Ústavu prírodných a syntetických polymérov FCHPT STU v Bratislave a Ústavu polymérov SAV v Bratislave sa podarilo zabezpečiť vysokú odbornú úroveň programu konferencie, ktorá si počas doterajších ročníkov získala pevné miesto medzi medzinárodnými vedeckými a odbornými podujatiami zameranými na gumárske a plastikárske produkty využívané hlavne v oblasti automobilizmu v európskom meradle. K propagácii konferencie a zvýrazneniu jej dôležitosti prispela aj účasť mediálnych partnerov z radov domácich a zahraničných odborných časopisov KGK, Elastomery a Gumárenské listy, ako aj podpora zo strany internetového portálu Plastic Portal.
Veľkým plusom konferencie bola prítomnosť veľkého počtu zahraničných účastníkov prakticky z celého sveta. Popri odbornom programe poskytli organizátori priestor aj na spoznanie krás Bratislavy v rámci prehliadky jej centra z paluby Bratislava City Train. Program konferencie vytvorili priestor aj na širokú výmenu názorov, rozvinutie osobných kontaktov, ako aj možnosť spoznať slovenskú kultúru počas koncertu na Malej scéne STU. Výkony slovenských umelcov nadchli prítomných a určite boli významnou podporou pozvaniu na budúci, už 8. ročník konferencie PMA 2019, ktorý sa spolu s 24. ročníkom gumárskej konferencie SRC 2019 uskutoční v máji 2019.

BYPoS 2017- 7th Bratislava Young Polymer Scientists workshop, Hotel Glamour, Zemplínska Šírava, Slovensko, 32 účastníkov, 12.06.-16.06.2017
BYPoS 2017 – 7. ročník medzinárodnej konferencie pre mladých polymérnych vedcov
V dňoch 12.–16. júna 2017 sa v hoteli Glamour v atraktívnom prostredí Zemplínskej Šíravy konala v poradí už siedma konferencia pod názvom BYPoS (Bratislava Young Polymer Scientists workshop). Ide o pravidelné stretnutia mladých vedeckých pracovníkov, ktoré sa začali v roku 2007. BYPoS je orientovaný na oblasť makromolekulovej chémie a poskytuje ideálnu možnosť mladým začínajúcim vedcom odprezentovať a diskutovať ich výsledky v medzinároron kolektíve.
Cieľom organizátorov tejto akcie je poskytnúť mladým začínajúcim vedcom dynamickú platformu, ktorá im umožní precvičiť si prezentačné zručnosti a zároveň poskytne vhodné osobné prostredie pre stimuláciu kritického myslenia a vznik spolupráce medzi mladými vedcami. Tento rok sme uvítali mladých z ôsmych krajín Európy vrátane Nemecka, Rakúska, Čiech, Ukrajiny, Maďarska, Srbska, Španielska a samozrejme Slovenska. Workshopu sa zúčastnili nielen PhD študenti ale aj diplomanti so záujmom o vedu. Svojou účasťou nás poctili aj piati pozvaní prednášatelia - úspešná a inšpiratívna dáma od našich západných susedov doc. Lucy Vojtová z Central European Institute of Technology - CEITEC, Brno, Prof. Christos Likos z Faculty of Physics University of Vienna, Dr.

Alfréd Kalláy-Menyhárd z Budapest University of Technology and Economics, Dr. Zoran Marković z Vinča Institute of Nuclear Sciences, University of Beograde, Srbsko, tohto času vedec na Ústave polymérov SAV ako držiteľ SASPRO štipendia a aj napriek veľkému pracovnému vyťaženiu medzi nás prišiel zástupca riaditeľa Ústavu polymérov SAV a vedúci Oddelenia syntézy a charakterizácie polymérov Dr. Jaroslav Mosnáček. Vo svojích kľúčových prezentáciách umožnili mladým vedeckým pracovníkom pohľad do ucelených tém ako sú syntéza, modifikácia a charakterizácia polymérov, inteligentné polyméry a biopolyméry, bio-aplikácie polymérov a fyzika polymérov.
Okrem odbornej časti mali účastníci čas aj na relax a oddych, v rámci ktorého spoznali krásy východoslovenskej prírody či už na na vychádzke okolo morského oka v pohorí Vihorlat alebo pri posedení a degustácii vynikajúcich vín v pivnici v Orechovej, kde hostia ochutnali aj typické zemplínske zabíjačkové špeciality.
Počas konferencie BYPoS bola vyhlásená súťaž BASF o najlepšiu prezentáciu. Hodnotiaca komisia pozostávajúca z pozvaných prednášateľov rozhodla o udelení ocenení za tri najlešie prezentácie. 1. miesto putovalo Sandre Orman (Technical University of Vienna), 2. miesto získal Balázs Kirschweng (Budapest University of Technology and Economics) a 3. miesto ostalo v domácich rukách a patrí Róbertovi Baloghovi (Ústav polymérov SAV).
Za dlhoročnú podporu tohto podujatia patrí poďakovanie v prvom rade vedeniu Ústavu polymérov, Slovenskej chemickej spoločnosti a odbornej skupine Polyméry, medzinárodným štruktúram EPF a CEEPN ako aj tohtoročným sponzorom firmám BASF, MERCI a Lach:ner.

Prvý medzinárodný workshop „mäkkých zručností“ pre mladých polymérnych vedcov, Ústav polymérov SAV, 24 účastníkov, 11.10.-16.10.2017

Rada mladých vedcov (RMV) pri Ústave polymérov SAV zorganizovala v dňoch 11. – 16. októbra 2017 prvý medzinárodný workshop zameraný na zlepšenie „mäkkých zručností“ – teda komunikačných schopností a zručností v akademickom písaní, ktoré sú pre kariéru mladého vedca rovnako dôležité ako odborné znalosti. Workshop bol určený pre doktorandov a mladých vedeckých pracovníkov z vybraných výskumných a vzdelávacích inštitúcií krajín V4Workshop podporil Medzinárodný vyšehradský fond.
Vybraní doktorandi a mladí vedeckí pracovníci z Ústavu polymérov SAV a z vybraných partnerských inštitúcií z Čiech (Ústav makromolekulární chemie Akadémie věd České republiky, v. v. i. a Univerzita Tomáše Bati ve Zlíne), Maďarska (Budapest University of Technology and Economics) a Poľska (Centre of Polymer and Carbon Material, Polish Academy of Sciences) mali takto možnosť zlepšiť svoje schopnosti v písaní a manažovaní projektov, v akademickom písaní a v prezentačných zručnostiach. Program workshopu zahrňoval aj praktickú časť – prácu na mikroprojektoch v skupinách pod vedením skúsených mentorov, profesionálov v oblasti „mäkkých zručností“.
Dlhodobejším cieľom tejto aktivity je zvýšiť konkurencieschopnosť mladých vedcov. Práca na mikroprojektoch má viesť k spolupráci medzi mladými vedcami v krajinách V4, uľahčiť diskusiu o spoločných vedeckých otázkach a vytvoriť tak platformu pre výmenu informácií. Ambíciou workshopu je zvýšiť povedomie o zúčastnených inštitúciách a ich výskumných témach, rozšíriť vedeckú mobilitu v regióne a nastaviť hrádzu proti takzvanému odlivu mozgov z krajín V4.

4.1.2. Medzinárodné vedecké podujatia, ktoré usporiada organizácia SAV v roku 2018 (anglický a slovenský názov podujatia, miesto a termín konania, meno, telefónne číslo a e-mail zodpovedného pracovníka)

4.1.3. Počet pracovníkov v programových a organizačných výboroch medzinárodných konferencií

Tabuľka 4a Programové a organizačné výbory medzinárodných konferencií

Meno pracovníka	Programový	Organizačný	Programový i organizačný
BEREK Dušan		**1**	**2**
CSOMOROVÁ Katarína		**1**	
HLOUŠKOVÁ Zuzana		**1**	
CHODÁK Ivan	**1**	**3**	
JOCHEC Mošková Daniela		**1**	**1**
KOLLÁR Jozef			**1**
KRONEK Juraj		**1**	
OMASTOVÁ Mária	**2**	**1**	**1**
PODHRADSKÁ Silvia			**1**
ŠIŠKOVÁ Alena			**2**
ŠIVOVÁ Mária		**1**	
ZAHORANOVÁ Anna			**1**
Spolu	**3**	**10**	**9**

4.2. Členstvo a funkcie v medzinárodných orgánoch

4.2.1. Členstvo a funkcie v medzinárodných vedeckých spoločnostiach, úniách a národných komitétoch SR

Doc. Ing. Dušan BEREK, DrSc.

Central European Group of Separation Sciences (funkcia: tajomník riadiaceho výboru)

Mgr. Juraj KRONEK, PhD.

Society for Biomedical Polymers and Polymeric Biomaterials (funkcia: člen)
Spoločné poľsko-slovenské laboratórium SYNADPOL (funkcia: koordinátor)

Ing. Igor LACÍK, DrSc.

Bioencapsulation research Group (funkcia: člen)
IUPAC Subcommittee Subcommittee Modeling of Polymerization Kinetics and Processes (funkcia: člen)
Titular Member IUPAC (funkcia: člen)

Mgr. Jaroslav MOSNÁČEK, DrSc.

Americká chemická spoločnosť (funkcia: člen)

Ing. Igor NOVÁK, PhD.

Society of Plastics Engineers, Antwerpy, Belgicko (funkcia: člen)

Ing. Mária OMASTOVÁ, DrSc.

European Polymer Federation (funkcia: národný reprezentant SR)
NK IUPAC (funkcia: členka)
SK UNECSO (funkcia: členka)

RNDr. Michal PROCHÁZKA, PhD.

EuCheMS European Young Chemists´ Network (funkcia: delegát Slovenskej chemickej spoločnosti)

Ing. Filip RÁZGA, PhD.

CELL - The Czech leukemia study group for life (funkcia: člen)

4.3. Účasť expertov na hodnotení medzinárodných projektov (EÚ RP, ESF a iných)

Tabuľka 4b Experti hodnotiaci medzinárodné projekty

Meno pracovníka	Typ programu/projektu/výzvy	Počet hodnotených projektov
BONDAREV Dmitrij	Súťaž Epsilon 3, AV ČR	1
HEYDARI Abolfzl	The National Fund for Scientific and Technological Development (FONDECYT) of the Chilean National Commission for Scientific and Technological Research	1
LACÍK Igor	JDRF Innovative grants	4
MOSNÁČEK Jaroslav	NCN (Narodowe Centrum Nauki, Poľsko)	1

4.4. Najvýznamnejšie prínosy MVTS ústavu vyplývajúce z mobility a riešenia medzinárodných projektov a iné informácie k medzinárodnej vedeckej spolupráci

LACÍK Igor - Polymer Division IUPAC: ako titulárny člen zodpovedný za posúdenie aplikácií o IUPAC podporu konferencií (posúdených ca 10-15 aplikácií)
Enkapsulačné konzorcium Juvenile Diabetes Research Foundation: ako člen tohto konzorcia posudzovanie podaných projektov a iniciácia vzniku JDRF microcapsule characterization core

Prehľad údajov o medzinárodnej mobilite pracovníkov organizácie je uvedený v Prílohe E.
Prehľad a údaje o medzinárodných projektoch sú uvedené v kapitole 2 a Prílohe B.

5. Vedná politika

Účasť ústavu na rozvoji vednej politiky sa realizovala a realizuje cez člena SKVH Ing. Igora Lacíka, DrSc. a zastúpením pracovníkov ústavu v predsedníctve SAV, Sneme SAV, v Rade riaditeľov II. Oddelenia vied a ďalších komisiách SAV a mimo SAV, ako aj v komisiách grantových agentúr VEGA a APVV.

6. Spolupráca s univerzitami/vysokými školami, štátnymi a neziskovými inštitúciami okrem aktivít uvedených v kap. 2, 3, 4

6.1. Spolupráca s univerzitami/VŠ (fakultami)

Názov univerzity/vysokej školy a fakulty: Prírodovedecká fakulta UK
Druh spolupráce (spoločné pracovisko alebo iné): Chemický ústav-neformálna spolupráca, spoločné výsledky a publikácie
Začiatok spolupráce: 2010
Zameranie: spektrálna charakterizácia organických molekúl v roztokoch a polymérových matriciach pre aplikácie vo fotonike a senzorike
Zhodnotenie: Spolupráca v roku 2017 pokračovala v charakterizácií derivátov s pyrénovým fluorofórom kovalentne viazaným s radikálovým centrum tetrametylpiperidínu s metyl-amínovým alebo imínovým mostíkom. Rozšírenie konjugácie z pyrénového jadra na imín vedie k foto-elektrónovému prenosu energie (PET), ktorý bol popísaný v rozpúšťadlách s rôznou polaritou a schopnosťou tvoriť vodíkové mostíky. Hlavne vďaka tomu bol pre pyrén-imínový derivát pozorovaný vznik exciplexu pyrén/metanol. Na druhej strane to vedie k redukcii PET a tým k zvýšeniu intenzity fluorescencie. Výraznou mierou prispeli DFT počítačové kalkulácie robené na PriFUK k interpretácií získaných spektrálnych výsledkov. Spoločná je v recenznom konaní v časopise Dyes and Pigments.

Názov univerzity/vysokej školy a fakulty: Fakulta chemickej a potravinárskej technológie STU
Druh spolupráce (spoločné pracovisko alebo iné): spoločné pracovisko
Začiatok spolupráce: 2008
Zameranie: výskum biodegradovateľných plastov
Zhodnotenie: Spolupráca v roku 2017 bola zameraná predovšetkým na pokračovanie zavádzania spoločného patentu do priemyselnej praxe. Pomerne veľké úsilie sa vynaložilo pri riešení organizačných otázok súvisiacich s podaním viacerých národných patentov. Pokračoval výkum možností využitia termoplastického škrobu ako matrice pre zmesi a kompozity na báze biodegradovateľných kompostovateľných plastov a začalo sa s testovaním zmien vlastností mteriálov účinkom kompostovania.
Výstup: SEDNIČKOVÁ, Michaela - PEKAŘOVÁ, S. – KUCHARCZYK, P. – BOČKAJ, J. - JANIGOVÁ, Ivica - KLEINOVÁ, Angela – JOCHEC MOŠKOVÁ, Daniela - OMANÍKOVÁ, L. - PERĎOCHOVÁ, D. – KOUTNÝ, M. – SEDLAŘÍK, M. - ALEXY, P. - CHODÁK, Ivan. Changes of physical properties of PLA-based blends during early stage of biodegradation in compost. International Journal of Biomacromolecules – v tlači

Názov univerzity/vysokej školy a fakulty: Drevárska fakulta TUZVO
Druh spolupráce (spoločné pracovisko alebo iné): zmluva o spolupráci
Začiatok spolupráce: 2017
Zameranie: Štúdium povrchových vlastností vybraných druhov dreva.
Zhodnotenie: Skúmali sa povrchové vlastnosti bukového, dubového, jaseňového a javorového dreva povrchovo upraveného bariérovou plazmou pri atmosférickom tlaku vo vzduchu, pričom sa zistilo, že povrchová energia dreva rastie v závislosti od tvrdosti dreva. Najvyšší rast povrchovej energie zistený pre javorové drevo s najnižšou tvrdosťou (tvrdosť = 3.0). Pokles povrchovej energie pre javorové drevo bol pritom v priebehu 2 týždňov starnutia najväčší. Povrchová energia jaseňového dreva (tvrdosť = 4.0) modifikovaného bariérovou plazmou sa po 14 dňoch starnutia znížila o 18% a pokles povrchovej energie javorového dreva bol vyšší, pričom dosiahol 35%.
Výstupy:

1. NOVÁK, Igor - *KRUPA, Igor* - CHODÁK, Ivan - ŽIGO, Ondrej - PREŤO, J. - VANKO, V. Investigation of wood-based polymer composites. In PMA 2017 & SRC 2017: International Conference on Polymeric Materials in Automotive: 23rd Slovak Rubber Conference: book of proceedings.

Techn.red. D. Jochec-Moskova. - Bratislava, Slovakia : Slovak University of Technology, Faculty of Chemical and Food Technology & Polymer Institute of SAS, 2017, p. 172-174. ISBN 978-80-89841-04-2.

2. NOVÁK, Igor - CHODÁK, Ivan - SEDLIAČIK, J. - ŽIGO, O. - MATYAŠOVSKÝ, J. - JURKOVIČ, P.Antibacterial modification of polymeric veneers by atmospheric discharge plasma. In Annals of Warsaw University of Life Sciences - SGGW: Forestry and Wood Technology, 2017, no. 98, p. 92-93. ISSN 1898-5912.

3. MATYAŠOVSKÝ, J. - JURKOVIČ, P. - ŠKULTÉTY, J. - DUCHOVIČ, P. - SEDLIAČIK, J. - KRYŠTOFIAK, T. - NOVÁK, Igor. Collagen and keratin as environmentally friendly natural polymers for modification of wood adhesives. In Wood - Science - Economy: 2th International Scientific Conference: proceedings. - Poznan, Poland: Wood Technology Institute, 2017, p. 73.

4. BEKHTA, P. - PROSZYK, S. - KRYŠTOFIAK, T. - SEDLIAČIK, J. - NOVÁK, Igor - MAMOŇOVÁ, M. Effects of short-term thermomechanical densification on the structure and properties of wood veneers. In Wood Materials Science & Engineering, 2017, vol. 12, no. 1, p. 40-54. (2017 - Scopus). ISSN 1748-0272.

Názov univerzity/vysokej školy a fakulty: Vysoká škola výtvarných umení v Bratislave
Druh spolupráce (spoločné pracovisko alebo iné): Spolupráca v rámci projektu ITMS 26240220088, podporeného operačným programom vedy a výskumu a financovaného ERDF
Začiatok spolupráce: 2016
Zameranie: Prepojenie textilných technológii s abstraktným umením.
Zhodnotenie: Spolupráca je zameraná na využitie elektrostatického zvlákňovania v oblasti úžitkového umenia. Základná myšlienka spolupráce viedla k spracovaniu plastového odpadu a využitia v bytovom designe.-

- TEXTILE ART OF TODAY, medzinárodná putovná výstava súčasnej umeleckej textilnej tvorby pod záštitou ministrov kultúry krajín V4 (Uherské Hradište (november 2016 – január 2017);
- Do not fall, reuse, maintain“: interaktívna výstava prác študentov Akadémie výtvarných umení v Bratislave; Ústav polymérov SAV. 15.02.–31.03.2017;-
- Medzinárodný strojársky veľtrh, Národné výstavisko AGROKOMPLEX v Nitre, 23.-25. 05.2017.
- NEARBY – FARAWAY, Galeria Umelka, Bratislava, 31.05.– 25.06.2017;
- Výstava NANO-Art, Materiálovo technologická fakulta STU, 30.05.2017-30.08.2017.

6.2. Významné aplikácie výsledkov výskumu v spoločenskej praxi alebo vyriešenie problému pre štátnu alebo neziskovú inštitúciu

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6.3. Iná činnosť využiteľná pre potreby spoločenskej praxe

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7. Spolupráca s aplikačnou a hospodárskou sférou okrem aktivít uvedených v kap. 2, 3, 4

7.1. Spoločné pracoviská s aplikačnou sférou

7.2. Kontraktový – zmluvný výskum (vrátane zahraničných kontraktov)

Názov kontraktu: Meranie horľavosti PUR pien
Partner(i): Kingspan Hradec Králové, ČR
Začiatok spolupráce (v súlade s podpísaným kontraktom): 2015
Ukončenie spolupráce (ak ide o spoluprácu v krátkom období): 2017
Objem získaných prostriedkov v bežnom roku (€): 395
Stručný opis výstupu/výsledku: Pomocou kónického kalorimetra bola testovaná horľavosť rozličným spôsobom upravených polyuretánových pien.
Zhodnotenie:

Názov kontraktu: Stanovenie rýchlostných konštánt a modelovanie súčasných v budúcnosti študovaných polymerizačných procesov a systémov v BASF. (Kinetic coefficients and models for existing and future polymerization processes and systems at BASF).
Partner(i): BASF SE Ludwigshafen (Nemecko), Queen's University, Kingston (Kanada)
Začiatok spolupráce (v súlade s podpísaným kontraktom): 2015
Ukončenie spolupráce (ak ide o spoluprácu v krátkom období): 2018
Objem získaných prostriedkov v bežnom roku (€): 35000
Stručný opis výstupu/výsledku: získanie individuálnych rýchlostných konštánt pre rôzne homopolymerizačné a kopolymerizačné systémy.
Zhodnotenie: Doterajšie poznatky boli rozšírené o homopolymerizáciu monomérov s permanentným katiónovým a aniónovým nábojom, o kopolymerizáciu rôznych nabitých monomérov za vzniku polyamfolytov, a SEC analýzu vzniknutých produktov.

Názov kontraktu: Zvýšenie životnosti vulkanizačních membrán
Partner(i): Continental a.s. Púchov
Začiatok spolupráce (v súlade s podpísaným kontraktom): 2016
Ukončenie spolupráce (ak ide o spoluprácu v krátkom období): 2017
Objem získaných prostriedkov v bežnom roku (€): 10000
Stručný opis výstupu/výsledku: Objednávateľovi sa odovzdali príslušné správy vrátane záverečnej správy, kde boli vyhodnotené všetky práce a uvedený záver v podobe odporúčania opatrení pre dosiahnutie cieľa zmluvy. Podrobnosti nie je možné zverejniť, pretože sú majetkom objednávateľa..
Zhodnotenie: Práce prispeli k vyriešeniu požiadavky objednávateľa, ktorý pripravuje prevádzkovú skúšku.

Názov kontraktu: New materials for adhesive polymers in dental composites.
Partner(i): IVOCLAR VIVADENT, AG. Schaan, Liechtenstein.
Začiatok spolupráce (v súlade s podpísaným kontraktom): 2016
Ukončenie spolupráce (ak ide o spoluprácu v krátkom období): 2017
Objem získaných prostriedkov v bežnom roku (€): 27174
Stručný opis výstupu/výsledku: Dokončili sa experimentálne práce ktoré sa týkali kinetiky radikálovej homopolymerizácie a kopolymerizácie s MMA nového monoméru obsahujúceho štruktúru schopnú AFCT (Addition Fragmentation Chain Transfer) ako aj metakrylátovú skupinu v jednej molekule - beta-allylsulfón 2-metakryloyloxy-ethyl-2-(tosylmetyl) akrylát. Beta-allylsulfónová časť pôsobí ako účinný AFCT reagent uvoľňovaním sulfonylového radikálu, ktorý iniciuje ďalšiu polymerizáciu metakrylátovej časti monoméru. AFCT proces výrazne ovplyvňuje

hustotu siete v zosietenom polyméri pre dentálne aplikácie, čo výrazne ovplyvňuje mechanické vlastnosti. Polymerizácie a kopolymerizácia s MMA boli sledované pomocou in situ 1H NMR, MALDI-TOF spektroskopiou a GPC chromatografiou. Polymerizácie poskytli hlavne oligoméry s nízkou disperzitou, obsahujúce sulfonylovú skupinu na začiatku reťazca. Podobná reaktivita metakrylátovej aj sulfonylovaj vinylovej skupiny je dôvodom účinného AFCT procesu. Výsledky riešenia kontraktu boli dodané vo forme záverečnej správy - The free radical homopolymerization of 7-(methacroyloxy)-2-oxo-heptylphosphonic acid, copolymerization with MMA and determination of copolymerization parameters..
Zhodnotenie: Zachovanie kontinuity spolupráce s Ivoclar Vivadent bolo významným vedeckým ako aj finančným prínosom pre ÚPo. Téma budúcej spolupráce bude predmetom plánovaných konzultácií.

Názov kontraktu: Non marking tool for production of pipe handling.
Partner(i): Texas Institute of Science
Začiatok spolupráce (v súlade s podpísaným kontraktom): 2016
/Ukončenie spolupráce (ak ide o spoluprácu v krátkom období): 2017
Objem získaných prostriedkov v bežnom roku (€): 9526
Stručný opis výstupu/výsledku: testovali sa fyzikálne vlastnosti radu plastových materiálov, pričom podstatné údaje predstavovali modul a pevnosť v tlaku a koeficient trenia. Podrobnosti nie je možné zverejniť. Spolupráca sa predčasne ukončila, pretože sme dospeli k záveru, že idea, ktorú chcel objednávateľ aplikovať v praxi, nie je uskutočniteľná. Objednávateľ v súhlase so zmluvou preplatil všetky vykonané práce.
Zhodnotenie: Výskum viedol k obohateniu experimentálnych skúseností najmä v oblasti modifikácie polymérnych materiálov pre vysoký koeficient trenia, čo možno využiť v budúcnosti aj pri vývoji špeciálnych adhezív.

Názov kontraktu: Nehorľavé systémy dle EN45545 pre výrobu kompozitov, kontrakt CZ.01.1.02-0.0-0.0-15_019/0004549
Partner(i): UTB Zlín
Začiatok spolupráce (v súlade s podpísaným kontraktom): 2017
Ukončenie spolupráce (ak ide o spoluprácu v krátkom období): 2017
Objem získaných prostriedkov v bežnom roku (€): 1782
Stručný opis výstupu/výsledku: Pomocou kónického kalorimetra bola testovaná horľavosť rozličným spôsobom upravovaných epoxidových kompozitov.

7.3. Iná činnosť využiteľná pre potreby hospodárskej praxe

Pomerne početné krátkodobé práce týkajúce sa meraní vlastností podľa požiadaviek zákazníkov, takmer výlučne menších slovenských firiem. V prevažnej väčšine prípadov sa riešili ad hoc problémy v prevádzke, alebo kvalite dodaných surovín, pričom vo viacerých prípadoch išlo o spory pri reklamáciach výrobkov dodaných zadávateľom konkrétnemu odberateľovi. V roku 2017 to boli napríklad merania pre firmy:
Elastorsa, a.s. Martin (FTIR analýzy) 500,00 €
Šimáček Facility SK(analýza tesniaceho krúžku) 240,00 €
Werba Chem, GmbH Austria (TGA anlýzy) 90,00 €

8. Aktivity pre Národnú radu SR, vládu SR, ústredné orgány štátnej správy SR a iné organizácie

8.1. Členstvo v poradných zboroch vlády SR, Národnej rady SR, ministerstiev SR, orgánoch EÚ, EP, NATO a pod.

Tabuľka 8a Členstvo v poradných zboroch Národnej rady SR, vlády SR, ministerstiev SR, orgánoch EÚ, EP, NATO a pod.

Meno pracovníka	Názov orgánu	Funkcia
Ing. Igor LACÍK, DrSc.	Ministerstvo školstva, vedy, výskumu a športu SR	člen Slovenskej komisie pre vedecké hodnosti SKVH – podskupina odborov vedy a techniky: chemické vedy
Ing. Igor LACÍK, DrSc.	Ministerstvo školstva, vedy, výskumu a športu SR	člen pracovnej skupiny pre Biomedicínu a biotechnológiu pre vedecké a výskumné kapacity RIS3 SK
Ing. Igor LACÍK, DrSc.	Ministerstvo zdravotníctva SR	člen pracovnej skupiny pre ďalšie smerovanie stratégie inteligentnej špecializácie pre Slovensko

8.2. Expertízna činnosť a iné služby pre štátnu správu a samosprávy

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8.3. Členstvo v radách štátnych programov a podprogramov ŠPVV a ŠO

Tabuľka 8b Členstvo v radách štátnych programov a podprogramov ŠPVV a ŠO

Meno pracovníka	Názov orgánu	Funkcia
Ing. Igor LACÍK, DrSc.	Rada APVV pre prírodné vedy	člen

8.4. Prehľad aktuálnych spoločenských problémov, ktoré riešilo pracovisko v spolupráci s Kanceláriou prezidenta SR, s vládnymi a parlamentnými orgánmi alebo pre ich potrebu

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9. Vedecko-organizačné a popularizačné aktivity

9.1.Vedecko-popularizačná činnosť

Tabuľka 9a Súhrnné počty vedecko-popularizačných činností organizácie SAV

Typ	Počet	Typ	Počet	Typ	Počet
prednášky/besedy	23	tlač	13	TV	5
rozhlas	11	internet	6	exkurzie	13
publikácie	0	multimediálne nosiče	0	dokumentárne filmy	0
iné	0				

9.2. Vedecko-organizačná činnosť

Tabuľka 9b Vedecko-organizačná činnosť

Názov podujatia	Domáca/ medzinárodná	Miesto	Dátum konania	Počet účastníkov
69. zjazd chemikov	domáca	Starý Smokovec, Vysoké Tatry, Slovensko	11.09.-15.09.2017	340
VII. medzinárodná konferencia o polymérnych materiáloch v automobilovom priemysle PMA 2017	medzinárodná	Konferenčné centrum Lindner Hotel - Bratislava, Slovensko	29.05.-31.05.2017	98
BYPoS 2017- 7th Bratislava Young Polymer Scientists workshop	medzinárodná	Hotel Glamour, Zemplínska Šírava, Slovensko	12.06.-16.06.2017	32
Prvý medzinárodný workshop „mäkkých zručností“ pre mladých polymérnych vedcov	medzinárodná	Ústav polymérov SAV, Bratislava, Slovensko	11.10.-16.10.2017	24

9.3. Účasť na výstavách

Názov výstavy: DO NOT FALL, REUSE, MAINTAIN - výstava prác študentov z Akadémie výtvarných umení v Bratislave na tému; Ústav polymérov SAV
Miesto konania: Ústav polymérov SAV, Bratislava
Dátum: 03.2017
Zhodnotenie účasti: Diela, ktoré vznikli v rámci projektu Centrum aplikovaného výskumu nových materiálov a transferu technológií, ITMS 26240220088 a sú výsledkom spolupráce s oddelením textilu VŠVU na tému Svetlo priestoru 2 - Prepojenie textilných technológii s abstraktným umením (zodpovedná pracovníčka – Šišková Alena)

Názov výstavy: NEARBY – FARAWAY – výstava
Miesto konania: Galery Umelka, Bratislava;
Dátum: 06.2017
Zhodnotenie účasti: -

Názov výstavy: NANO-Art
Miesto konania: MTF STU, Trnava
Dátum: 08.2017
Zhodnotenie účasti: -

Názov výstavy: TEXTILE ART OF TODAY, medzinárodná putovná výstava súčasnej umeleckej

textilnej tvorby pod záštitou ministrov kultúry krajín V4

Miesto konania: Uherské Hradište, ČR
Dátum: 1.2017
Zhodnotenie účasti: -

Názov výstavy: 43. medzinárodná poľnohospodárska a potravinárska výstava Agrokomplex 2017
Miesto konania: Výstavisko Agrokomplex, Nitra - stánok SAV
Dátum: 08.2017
Zhodnotenie účasti: -

Názov výstavy: 24. medzinárodný veľtrh strojov, nástrojov, zariadení a technológií
Miesto konania: Výstavisko Agrokomplex, Nitra - stánok Slovenskej zváračskej spoločnosti
Dátum: 05.2017
Zhodnotenie účasti: Aktívna účasť na výstavách a veľtrhoch za účelom inštalácie a propagácie špeciálnych adhezív z Ústavu polymérov v rámci expozície SAV-I) (zodpovedná pracovníčka – Podhradská Silvia)

9.4. Účasť v programových a organizačných výboroch národných konferencií

Tabuľka 9c Programové a organizačné výbory národných konferencií

Meno pracovníka	Programový	Organizačný	Programový i organizačný
DANKO Martin	0	1	0
HLOUŠKOVÁ Zuzana	0	0	1
OMASTOVÁ Mária	0	0	1
PROCHÁZKA Michal	0	1	0
Spolu	0	2	2

9.5. Členstvo v redakčných radách časopisov

Doc. Ing. Dušan Berek, DrSc.

Chemistry and Chemical Technology (Ukraina) (funkcia: člen edičnej rady)
International Journal of Polymeric Materials (USA) (funkcia: člen edičnej rady)
Macromolecules - An Indian Journal (India) (funkcia: člen edičnej rady)

Ing. Zuzana Hloušková

ChermZi (funkcia: člen redakčnej rady)

Prof. Ing. Ivan Chodák, DrSc.

The Open Macromolecules Journal (TOMACROJ),
Bentham Open (funkcia: člen redakčnej rady)

Ing. Igor Lacík, DrSc.

Frontiers in Biomaterials (funkcia: review editor)
Chemical Industry and Chemical Engineering Quarterly (Srbsko a Čierna Hora) (funkcia: člen international advisory board)

Mgr. Jaroslav Mosnáček, DrSc.

časopis ISRN Polymer Science (funkcia: člen edičnej rady)
Frontiers in Materials: Composite Materials (funkcia: review editor časopisu)

Ing. Igor Novák, PhD.

CHEMagazín (ČR) (funkcia: externý člen edičnej rady)
Urob si sám (funkcia: člen redakčnej rady)

Ing. Mária Omastová, DrSc.

ChemZi (funkcia: členka redakčnej rady)

9.6. Činnosť v domácich vedeckých spoločnostiach

Doc. Ing. Dušan Berek, DrSc.

Slovenský národný komitét chémie pre IUPAC (funkcia: podpredseda)
výbor odborných skupín Chromatografia SCHS (funkcia: člen)

Mgr. Martin Danko, PhD.

SCHS (funkcia: predseda výboru odbornej skupiny Polyméry)

RNDr. Agnesa Fiedlerová

SCHS (funkcia: tajomníčka výboru odbornej skupiny Polyméry)

Štefan Chmela, DrSc.

SCHS (funkcia: člen výboru odbornej skupiny Polyméry)

Mgr. Juraj Kronek, PhD.

SCHS (funkcia: Podpredseda odbornej skupiny Polyméry)

Ing. Igor Lacík, DrSc.

Slovenský národný komitét IUPAC (funkcia: člen)

Ing. Mária Omastová, DrSc.

SCHS (funkcia: podpredsedníčka výboru odbornej skupiny Polyméry)

RNDr. Michal Procházka, PhD.

Slovenská chemická spoločnosť (funkcia: člen predsedníctva)

9.7. Iné dôležité informácie o vedecko-organizačných a popularizačných aktivitách

V r. 2017 Ústav polymérov SAV organizoval jedno národné a štyry medzinárodné vedecké podujatia:

- 7th International Conference Polymeric Materials in Automotive & 23rd Slovak Rubber Conference, 29.-31.05.2017, Bratislava
- 7th Bratislava Young Polymer Scientists Workshop BYPoS, 12.-16.06.2017, Zemplínska Šírava
- 67. Zjazd chemických spoločností, 11.-15. 09. 2017, Starý Smokovec
- Soft Skills Training – V4 Workshop for Young Scientists, 11.-16.10.2017, Bratislava

Ústav polymérov SAV pokladá za významné vedecko-popularizačné aktivity v rôznych médiách v zmysle súčasných trendov SAV. Propagácia sa v roku 2017 týkala mnohých vystúpení formou tlače, rozhlasu, televízie, internetu, osobných stretnutí a pod. Projekty a celková činnosť ústavu boli opäť úspešne prezentované na Noci výskumníka, v rámci Týždna vedy a techniky a tiež v rôznych diskusných stretnutiach s odbornou i laickou verejnosťou. Ústav polymérov SAV bol zviditeľnený i udelením niekoľkých významných ocenení – v 20. ročníku oceňovania významných slovenských vedcov, technológov a mladých výskumníkov zo všetkých oblastí vedy a techniky sa Vedkyňou roka 2016 stala Ing. Mária Omastová, DrSc., Cenu za vedu a techniku za rok 2017 v kategórii Celoživotné zásluhy v oblasti vedy a techniky dostal Prof. Ivan Chodák, DrSc. a na Interaktívnej Konferencii Mladých Vedcov občianskeho združenia Preveda získal ocenenie študent 1. ročníka PhD štúdia Ing. Robert Balogh.
Práca na téme liečby cukrovky je propagovaná cez neinvestičný fond Cukrovka n.f. (www.cukrovkanf.sk).

10. Činnosť knižnično-informačného pracoviska

10.1. Knižničný fond

Tabuľka 10a Knižničný fond

Knižničné jednotky spolu		8152
z toho	knihy a zviazané periodiká	8152
	audiovizuálne dokumenty	0
	elektronické dokumenty (vrátane digitálnych)	2
	mikroformy	0
	iné špeciálne dokumenty - dizertácie, výskumné správy	148
	Rukopisy, vzácne tlače	0
Počet titulov dochádzajúcich periodík		4
z toho zahraničné periodiká		1
Ročný prírastok knižničných jednotiek		7
v tom	kúpou	7
	darom	0
	výmenou	0
	bezodplatným prevodom	0
	náhradou	0
Úbytky knižničných jednotiek		0
Knižničné jednotky spracované automatizovane		0

*Výraz **„v tom“** označuje úplné (vyčerpávajúce) údaje, ktorých súčet sa musí rovnať údaju v riadku „spolu“, čiže nadradenému riadku.*
*Výraz **„z toho“** označuje neúplné (výberové) údaje, ktorých súčet sa nemusí rovnať údaju v riadku „spolu“.*

10.2. Výpožičky a služby

Tabuľka 10b Výpožičky a služby

Výpožičky spolu (riadok 1)		**723**
v tom z r. 1	prezenčné výpožičky	65
	absenčné výpožičky	658
v tom z r. 1	odborná literatúra pre dospelých	658
	výpožičky periodík	65
MVS iným knižniciam		7
MVS z iných knižníc		0
MMVS iným knižniciam		0
MMVS z iných knižníc		0
Počet vypracovaných bibliografií		0

Počet vypracovaných rešerší	236

10.3. Používatelia

Tabuľka 10c Používatelia

Registrovaní používatelia	50
Návštevníci knižnice spolu (bez návštevníkov podujatí)	135

10.4. Iné údaje

Tabuľka 10d Iné údaje

On-line katalóg knižnice na internete (1=áno, 0=nie)	0
Náklady na nákup knižničného fondu v €	1091

10.5. Iné informácie o knižničnej činnosti

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11. Aktivity v orgánoch SAV

11.1. Členstvo vo Výbore Snemu SAV

11.2. Členstvo v Predsedníctve SAV a vo Vedeckej rade SAV

Ing. Mária Omastová, DrSc.

- členka Predsedníctva SAV, zástupkyňa Vedeckého sekretára
- členka Vedeckej rady SAV

11.3. Členstvo vo vedeckých kolégiách SAV

RNDr. Peter Cifra, DrSc.

- VK SAV pre chemické vedy (člen)

Ing. Igor Lacík, DrSc.

- VK SAV pre chemické vedy (člen)

Ing. Mária Omastová, DrSc.

- VK SAV pre chemické vedy (člen)

11.4. Členstvo v komisiách SAV

Prof. Ing. Tomáš Bleha, DrSc.

- Komisia SAV pre vyhodnocovanie medzinárodných projektov (člen)

Prof. Ing. Ivan Chodák, DrSc.

- Komisia SAV pre duševné vlastníctvo, inovácie a technologický transfer (člen)
- Rada programu centier excelentnosti SAV (člen)

Ing. Igor Lacík, DrSc.

- Komisia SAV pre duševné vlastníctvo, inovácie a technologický transfer (člen)

- Komisia SAV pre ekonomické otázky (člen)
- Komisia SAV pre medzinárodnú vedecko-technickú spoluprácu (člen)

Mgr. Jaroslav Mosnáček, DrSc.

- Komisia SAV pre infraštruktúru a štrukturálne fondy (člen)

Ing. Mária Omastová, DrSc.

- Akreditačná komisia SAV (predsedníčka)
- Komisia SAV pre medzinárodnú vedecko-technickú spoluprácu (predsedníčka)

Mgr. Zdenko Špitálsky, PhD.

- Komisia SAV pre komunikáciu a médiá (člen)

11.5. Členstvo v orgánoch VEGA

RNDr. Peter Cifra, DrSc.

- Komisia VEGA číselný kód 10409, Odbor vedy a techniky/špecializácia: Makromolekulová chémia (člen)

Mgr. Jaroslav Mosnáček, DrSc.

- Komisia VEGA číselný kód 10409, Odbor vedy a techniky/špecializácia: Makromolekulová chémia (člen)

12. Hospodárenie organizácie

12.1. Výdavky PO SAV

Tabuľka 12a Výdavky PO SAV (v €)

V ý d a v k y	Skutočnosť k 31.12.2017 spolu	v tom:			
		zo ŠR od zriaďovateľa	z vlastných zdrojov	z iných zdrojov	z toho:
					ŠF EÚ
Výdavky spolu	2 437 724	1 482 646	316 986	638 092	
Bežné výdavky	2 407 043	1 477 076	291 875	638 092	
v tom:					
mzdy (610)	1 080 188	880 224	50 638	149 326	
poistné a príspevok do poisťovní (620)	367 413	281 320	36 628	49 465	
tovary a služby (630)	684 275	229 225	191 624	263 426	
z toho: časopisy	0	0	0	0	
VEGA projekty	117 360	117 360	0	0	
MVTS projekty	82 506	82 506	0	0	
CE	0	0	0	0	
vedecká výchova	5 160	5 160	0	0	
bežné transfery (640)	257 167	86 307	12 985	175 875	
z toho: štipendiá	87 827	86 307	1 520	0	
transfery partnerom projektov	175 875	0	0	175 875	
Kapitálové výdavky	30 681	5 570	25 111	0	
v tom:					
obstarávanie kapitálových aktív	25 111	0	25 111	0	
kapitálové transfery	5 570	5 570	0	0	
z toho: transfery partnerom projektov	0	0	0	0	

12.2. Príjmy PO SAV

Tabuľka 12b Príjmy PO SAV (v €)

P r í j m y	**Skutočnosť k 31.12.2017 spolu**	**v tom:**	
		rozpočtové	**z mimoroz p. zdrojov**
Príjmy spolu	2 451 899	1 482 646	
Nedaňové príjmy	2 451 899	1 482 646	969 253
v tom:			
príjmy z prenájmu	28 800	0	28 800
príjmy z predaja výrobkov a služieb	250 000	0	250 000
iné	40 000	0	40 000
Granty a transfery (mimo zdroja 111)	650 453	0	650 453
v tom:			
tuzemské	620 711		620 711
z toho: APVV	615 920		615 920
iné	4 791		4 791
zahraničné	29 742		29 742
z toho: projekty rámcového programu EÚ	0	0	0
iné	0	0	0

13. Nadácie a fondy pri organizácii SAV

Názov: **Neinvestičný fond Cukrovka n.f. (www.cukrovkanf.sk)**
Zameranie: Podpora výskumu spojeného s liečbou cukrovky transplantáciou pankreatických ostrovčekov
Opis: Neinvestičný fond Cukrovka n.f. s cieľom získať prostriedky najmä na:
• podporu výskumu a všetkých aktivít spojených s liečbou cukrovky transplantáciou pankreatických ostrovčekov, ktoré sú enkapsulované v polymérnej membráne,
• podporu vzdeláva
nia a informovania verejnosti vo forme podávania informácií o nových trendoch v liečbe cukrovky,
• podporu študijných pobytov, školení, prednášok, konferencií, • podporu tvorby prístrojovej infraštruktúry

14. Iné významné činnosti organizácie SAV

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15. Vyznamenania, ocenenia a ceny udelené pracovníkom organizácie v roku 2017

15.1. Domáce ocenenia

15.1.1. Ocenenia SAV

OMASTOVÁ Mária
Vedkyňa roka 2016
Oceňovateľ: CVTI SR, SAV a ZSVTS
Opis: za aplikáciu nanotechnológií v interdisciplinárnom výskume polymérnych kompozitov a nanokompozitov so zameraním na senzory, biosenzory, aktuátory a solárne články - 20 ročník oceňovania významných slovenských vedcov, technológov a mladých výskumníkov zo všetkých oblastí vedy a techniky

15.1.2. Iné domáce ocenenia

BALOGH Róbert
Súťaž o najlepšiu prezentáciu na workshope BYPoS
Oceňovateľ: BYPoS
Opis: 3. miesto v súťaži o najlepšiu prezentáciu na workshope BYPoS, Zemplínska Šírava, jún 2017

BALOGH Róbert
ocenenie na Interaktívnej Konferencii Mladých Vedcov občianskeho združenia Preveda
Oceňovateľ: občianskeho združenia Preveda

Chodák Ivan
laureát Ceny za vedu a techniku za rok 2017
Oceňovateľ: Minister školstva, vedy, výskumu a športu
Opis: v kategórii Celoživotné zásluhy v oblasti vedy a techniky – udeľuje v rámci celoslovenského Týždňa vedy a techniky 2017 minister školstva, vedy, výskumu a športu;

RYCHLÝ Jozef
ocenenie II. Triedy
Oceňovateľ: STU - Materiálovotechnologická fakulta so sídlom v Trnave
Opis: pri príležitosti 10. Výročia založenia Ústavu integrovanej bezpečnosti

ŠPITÁLSKY Zdenko
2. miesto na ŠVOČ (s diplomantkou A. Fečkovou)
Oceňovateľ: Strojnícka fakulta STU
Opis: Strojnícka fakulta STU, sekcia Výrobné systémy a environmentálna technika

ŠVAJDLENKOVÁ Helena
Súťaž Mladých vedeckých pracovníkov ÚPo SAV
Oceňovateľ: ÚPo SAV
Opis: 1. miesto v súťaži Mladých vedeckých pracovníkov ÚPo SAV o najlepšiu publikáciu 2017.

15.2. Medzinárodné ocenenia

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16. Poskytovanie informácií v súlade so zákonom č. 211/2000 Z. z. o slobodnom prístupe k informáciám v znení neskorších predpisov (Zákon o slobode informácií)

Na pracovisku nebola zaznamenaná žiadna požiadavka o poskytnutie informácií v zmysle uvedeného zákona.

17. Problémy a podnety pre činnosť SAV

V r. 2017 sa vyjasnila situácia ohľadne plánovanej transformácie inštitúcií SAV na verejno-výskumné inštitúcie, na ktoré by sa mali ústavy transformovať od 1. júla 2018. Vzhľadom k tomu bolo potrebné dovŕšiť prípravu zákona o vvi ako aj interné predpisy o fungovaní vvi. Do prípravy týchto dokumentov sa zapájal ústav svojimi pripomienkami. Prechod na vvi, otvára ústavom nové možnosti a bude preto veľkou výzvou, ako sa v budúcnosti nášmu ústavu podarí tieto možnosti využiť pre zlepšenie prostredia pre výskum ako i zvyšovanie kvality vedeckých pracovníkov.
Za posledné roky sa nám podarilo vytvoriť pomerne kvalitné podmienky z pohľadu infraštruktúry, avšak rozvoj ústavu (a SAV), ďalšie financovanie, kvalita projektov a kvalita výstupov je kriticky podmienená kvalitou ľudských zdrojov. Ústav polymérov SAV sa snaží naplno využívať rôzne možnosti získavania postdoktorandov zo zahraničia, najmä cez agentúru SAIA, cez ktorú prišlo pracovať na ústav v roku 2017 na dobu minimálne 1 mesiaca viacero postdoktorandov alebo študentov z rôznych krajín sveta, ale i z finančných rezerv ústavu, ktoré v roku 2017 pokryli pobyty 2 zahraničných postdokov. Tak ako už niekoľkokrát v minulosti i v roku 2017 sme narazili na problémy prijímania postdokov z ázijských krajín. Dôvodom bola prílišná byrokracia pri získavaní prechodného pobytu, ktorá vyžaduje dodanie superlegalizovaného výpisu z registra trestov zo všetkých krajín, v ktorých záujemca pôsobil počas posledných troch rokov viac ako šesť mesiacov. Pre aktívnych vedeckých pracovníkov, ktorí po PhD. štúdiu zbierajú skúsenosti v rôznych vedecko-výskumných inštitúciach v rôznych krajinách sveta, je táto byrokratická požiadavka niekedy významným problémom, ktorý ich odradí od zapojenia sa do výskumu na slovenskej inštitúcii. Výnimka potreby dodania týchto dokumentov napr. pre vedeckých pracovníkov, ktorí by chceli pôsobiť na Slovensku nie dlhšie ako 1 rok, by významne uľahčila získavanie skúsených zahraničných vedeckých pracovníkov na výskumné pobyty na slovenských inštitúciách.

Správu o činnosti organizácie SAV spracoval(i):

Ing. Katarína Csomorová, 02/ 3229 4307
Ing. Zuzana Hloušková, 02/ 3229 4328
Ing. Angela Kleinová, 02/ 3229 4368
Mgr. Monika Majerčíková, 02/ 3229 4319
Ing. Mária Omastová, DrSc., 02/ 3229 4312
Ing. Nadežda Petrenčíková, 02/ 3229 4371
Mgr. Zdenko Špitálsky, PhD., +421-2-3229 4325(4322,4330,4306)

Riaditeľ organizácie SAV	**Predseda vedeckej rady**
.....	.....
Ing. Igor Lacík, DrSc.	RNDr. Peter Cifra, DrSc.

Prílohy

Príloha A

Zoznam zamestnancov a doktorandov organizácie k 31.12.2017

Zoznam zamestnancov podľa štruktúry (nadväzne na údaje v Tabuľke 1a)

	Meno s titulmi	Úväzok (v %)	Ročný prepočítaný úväzok
Vedúci vedeckí pracovníci DrSc.			
1.	Ing. Josef Bartoš, DrSc.	100	1.00
2.	Prof., RNDr. Ignác Capek, DrSc.	40	0.40
3.	RNDr. Peter Cifra, DrSc.	100	1.00
4.	Štefan Chmela, DrSc.	70	0.70
5.	Prof. Ing. Ivan Chodák, DrSc.	100	1.00
6.	Ing. Igor Lacík, DrSc.	100	1.00
7.	Mgr. Jaroslav Mosnáček, DrSc.	100	1.00
8.	Ing. Mária Omastová, DrSc.	70	0.60
9.	Ing. Jozef Rychlý, DrSc.	30	0.30
Samostatní vedeckí pracovníci			
1.	Mgr. Zuzana Benková, PhD.	100	1.00
2.	RNDr. Dmitrij Bondarev, PhD.	100	1.00
3.	Mgr. Martin Danko, PhD.	100	1.00
4.	Ing. Anita Eckstein, PhD.	100	1.00
5.	Ing. Ivica Janigová, PhD.	100	1.00
6.	Mgr. Jozef Kollár, PhD.	100	1.00
7.	Mgr. Juraj Kronek, PhD.	100	1.00
8.	Mgr. Zuzana Kroneková, PhD.	100	1.00
9.	Ing. Matej Mičušík, PhD.	100	1.00
10.	Ing. Igor Novák, PhD.	60	0.60
11.	Ing. Filip Rázga, PhD.	105	1.05
12.	Mgr. Zdenko Špitálsky, PhD.	100	1.00
Vedeckí pracovníci			
1.	Ing. Katarína Borská, PhD.	100	0.00
2.	Abolfzl Heydari, PhD.	100	0.83
3.	Ing. Gabriela Hloušková, PhD.	100	0.00
4.	Ing. Markéta Ilčíková, PhD.	100	0.00
5.	Ing. Daniela Jochec Mošková, PhD.	60	0.35
6.	Ing. Lucia Kleščíková, PhD.	100	1.00
7.	Ing. Jaroslav Kuliček, PhD.	100	0.40
8.	Ing. Miroslava Lukešová, PhD.	100	0.00

9.	Ing. Marta Malíková, PhD.	50	0.00
10.	Mgr. Zoran Markovic, PhD.	100	1.00
11.	Ing. Daniela Moravčíková, PhD.	100	0.10
12.	Mgr. Katarína Mosnáčková, PhD.	100	0.97
13.	Mgr. Kristián Peptu, PhD.	100	1.00
14.	Falko Pippig, PhD.	100	0.58
15.	Mgr. Silvia Podhradská, PhD.	100	1.00
16.	RNDr. Michal Procházka, PhD.	100	1.00
17.	Ing. Michaela Sedničková, PhD.	100	1.00
18.	Ing. Alena Šišková, PhD.	100	1.00
19.	Mgr. Petra Šrámková, PhD.	100	0.40
20.	Ing. Helena Švajdlenková, PhD.	100	1.00
21.	Ing. Dušana Treľová, PhD.	100	1.00
22.	Ing. Lucia Uhelská, PhD.	30	0.09
23.	Mgr. Anna Zahoranová, PhD.	100	1.00
Odborní pracovníci s VŠ vzdelaním (výskumní a vývojoví zamestnanci)			
1.	Ing. Róbert Balogh	10	0.70
2.	Mgr. Stanislav Bilka	5	0.02
3.	Ing. Nikola Bugárová	10	0.10
4.	Ing. Zuzana Cseriová	100	1.00
5.	Ing. Katarína Csomorová	100	1.00
6.	Ing. Peter Čakánek	10	0.03
7.	Ing. Eliška Číková	10	0.10
8.	RNDr. Agnesa Fiedlerová	100	1.00
9.	Ing. Eva Habánková	10	0.03
10.	Ing. Zuzana Hloušková	100	1.00
11.	Ing. Ana Hološ	10	0.10
12.	Ing. Ľudmila Hrčková	60	0.60
13.	Ing. Anna Chovancová	100	1.00
14.	Ing. František Ivanič	10	0.10
15.	Ing. Angela Kleinová	100	1.00
16.	Mgr. Igor Koreň	20	0.20
17.	Mgr. Mária Kováčová	10	0.10
18.	Mgr. Petra Mazancová	10	0.10
19.	Mgr. Veronika Némethová	10	0.10
20.	Ing. Zuzana Nógellová	100	1.00
21.	Mgr. Michal Pelach	100	0.58
22.	Ing. Nadežda Petrenčíková	80	0.80
23.	Ing. Lucia Rišpanová	10	0.10
24.	Mgr. Maroš Smolíček	10	0.03

25.	Ing. Mária Šivová	100	1.00
26.	Ing. Ondrej Žigo, PhD.	100	1.00
Odborní pracovníci s VŠ vzdelaním (ostatní zamestnanci)			
1.	Mgr. Monika Majerčíková	100	1.00
Odborní pracovníci ÚSV			
1.	Viera Bombová	100	0.23
2.	Katarína Cinová	100	1.00
3.	Nadežda Danková	100	1.00
4.	Eva Hipká	100	1.00
5.	Ivona Hrodeková	100	1.00
6.	Erika Juričkovičová	100	0.06
7.	Sidónia Kalinová	100	1.00
8.	Jozef Kandráč	80	0.80
9.	Viera Karlíková	100	1.00
10.	Marcela Kimličková	100	1.00
11.	Zuzana Kuželová	100	1.00
12.	Marta Mitošinková	100	1.00
13.	Iveta Nestarcová	100	1.00
Ostatní pracovníci			
1.	Peter Kečkéš	40	0.40
2.	Apostol Todorov Nedelčev	40	0.40
3.	Zuzana Ondrušová	100	1.00
4.	Daniela Pírová	100	1.00

Zoznam zamestnancov, ktorí odišli v priebehu roka

	Meno s titulmi	**Dátum odchodu**	**Ročný prepočítaný úväzok**
Vedúci vedeckí pracovníci DrSc.			
1.	Prof., RNDr. Ignác Capek, DrSc.	31.12.2017	0.40
Samostatní vedeckí pracovníci			
1.	Ing. Dušan Račko, PhD.	31.7.2017	0.00
Vedeckí pracovníci			
1.	Mgr. Milan Fraňo, PhD.	31.7.2017	0.58
2.	Mgr. Vladimír Raus, PhD.	31.3.2017	0.25
Odborní pracovníci s VŠ vzdelaním (výskumní a vývojoví zamestnanci)			
1.	Mgr. Rastislav Baran	30.6.2017	0.03
2.	Ing. Michal Jánsky	31.10.2017	0.25
3.	Ing. Eva Macová	31.1.2017	0.08
4.	Ing. Nadežda Petrenčíková	31.12.2017	0.80
5.	Mgr. Jozef Prachár	23.8.2017	0.13

6.	Ing. Mária Šivová	31.12.2017	1.00
Odborní pracovníci ÚSV			
1.	Sidónia Kalinová	31.12.2017	1.00

Zoznam doktorandov

	Meno s titulmi	Škola/fakulta	Študijný odbor
Interní doktorandi hradení z prostriedkov SAV			
1.	Ing. Róbert Balogh	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia
2.	Ing. Nikola Bugárová	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia
3.	Ing. Peter Čakánek	Prírodovedecká fakulta UK	4.1.18 fyzikálna chémia
4.	Ing. Eliška Číková	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia
5.	Ing. Eva Habánkova	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia
6.	Ing. Ana Hološ	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia
7.	Ing. Anna Chovancová	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia
8.	Ing. František Ivanič	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia
9.	Mgr. Mária Kováčová	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia
10.	Mgr. Petra Mazancová	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia
11.	Ing. Veronika Némethová	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia
12.	Ing. Lucia Rišpanová	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia
13.	Mgr. Maroš Smolíček	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia
Interní doktorandi hradení z iných zdrojov			
organizácia nemá interných doktorandov hradených z iných zdrojov			
Externí doktorandi			
1.	Ing. Martina Hudáková	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia

Zoznam zamestnancov prijatých do jedného roka od získania PhD.

	Meno s titulmi	Dátum obhajoby	Dátum prijatia	Úväzok (v %)

Zoznam emeritných vedeckých zamestnancov

	Meno s titulmi
1.	Ing. Jaroslav Bartoň, DrSc.
2.	Ing. Dušan Berek, DrSc.
3.	Prof. Ing. Tomáš Bleha, DrSc.
4.	Prof. Ing. Eberhard Borsig, DrSc.
5.	Doc. Ing. Štepán Florian, PhD.
6.	Prof., RNDr. Pavol Hrdlovič, DrSc.
7.	Ing. Dieter Lath, PhD.
8.	Ing. Milan Lazár, DrSc.
9.	Ing. Ivan Lukáč, PhD.
10.	Ing. Ivan Novák, CSc.
11.	Ing. Juraj Pavlinec, PhD.
/12.	RNDr. Jan Plaček, PhD.
13.	Ing. Vladimír Pollák, PhD.
14.	Ing. Lýdia Rychlá, DrSc.
15.	RNDr. František Szocs, DrSc.
16.	Prof., RNDr. Jozef Tiňo, DrSc.

Príloha B

Projekty riešené v organizácii

Medzinárodné projekty

Programy: Medziakademická dohoda (MAD)

1.) Syntéza funkcionalizovaných biokompatibilných polyesterových kopolymérov. *(Synthesis of functionalized biocompatible polyester copolymers.)*

Zodpovedný riešiteľ:	Martin DANKO
Trvanie projektu:	1.01.2016 / 31.12.2018
Evidenčné číslo projektu:	bilaterálny slovensko-poľský
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	2 - Poľsko: 2
Čerpané financie:	mobilita

Dosiahnuté výsledky:

Projekt je zameraný za prípravu funkčných polyesterov na báze ε-kaprolaktónu a α-metylén ɤ-butyrolaktónu (P(MBL-co-CL), ktorých násobná väzba pozdĺž reťazca dovoľuje ich modifikáciu. Pokračovalo sa v experimentoch kopolymerizácie MBL, s ε-CL v podmienkach ROP iniciáciou Al(OiPr)3 v teplotnom rozmedzí -78–20°C. Štúdie ROP potvrdili vznik polyméru s Mn = 20 000-45 000 g mol-1 (Đ = 1.15-1.30) do teploty 0°C a obsahom MBLv kopolyméri 5 – 25 mol %. Následne sa uskutočnili modelové modifikácie pomocou tiol-énovej reakcie v miernych podmienkach foto-aktivácie s N-acetyl cysteínom a termo-aktivácie s fluorescenčným tiolom benzotioxantónu, ktoré potvrdili funkčnosť polyéteru.

Výstupy:

1. DANKO, Martin - MOSNÁČEK, Jaroslav. Ring-opening polymerization of gamma-butyrolactone and its derivatives: A review. In POLIMERY-W, 2017, vol. 62, no. 4, p. 272-282. (0.778 - IF2016). ISSN 0032-2725.

2. DANKO, Martin - *ĎURKÁČOVÁ, Slávka* - MOSNÁČEK, Jaroslav. Tulipaline a and epsilon-caprolactone ROC - polyesters with double bond functionality. In ICBP 2017 with BCRS - Taiwan Annual Meeting. - Yuan Ze, Taiwan: Yuan Ze University, 2017, p. 120.

3. DANKO, Martin - *ĎURKÁČOVÁ, Slávka* - MOSNÁČEK, Jaroslav. Functional polyesters from tulipaline a and epsilon-caprolactone. In ChemZi: Slovenský časopis o chémii pre chemické vzdelávanie, výskum a priemysel, 2017, roč. 13, č. 1, s. 110-111. ISSN 1336-7242

2.) Štúdium povrchových vlastností vybraných funkcionalizovaných polyolefínov. *(Study of surface properties of selected functionalized polyolefins.)*

Zodpovedný riešiteľ:	Igor NOVÁK
Trvanie projektu:	1.01.2014 / 31.12.2018
Evidenčné číslo projektu:	-
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	1 - Česko: 1

Čerpané financie: mobilita

Dosiahnuté výsledky:
Boli študované povrchové a adhézne vlastnosti metalocénového etylén-okténového (MEO) štatistického kopolyméru po povrchovej modifikácii ozónom s následujúcim očkovaním kyselinou akrylovou (AA). Statický uhol zmáčania vodou (WCA) nemodifikovaného MEO dosahoval hodnotu 106,4o, ktorá sa po očkovaní MEO kyselinou akrylovou znížila. Tento pokles závisel od množstva AA naviazanej očkovaním. Pri naviazaní 14,1 % AA na MEO bol WCA = 99o, pri 26,8 % AA sa zistil pokles WCA = 87 o. Nárast hydrofilnosti vzoriek MEO sa po očkovaní AA prejavil rastom polárnej zložky voľnej povrchovej energie, ktorá sa zvýšila z 2,3 mJ/m2 (nemodifikovaná vzorka) na 3,6 mJ/m2 (14.1 % AA), resp. 3,9 mJ/m2 (26,8 % AA). Tepelná odolnosť v odlupovaní a v šmyku adhéznych spojov nemodifikovaný MEO - papier dosiahla hodnotu 64 oC, ale po očkovaní s AA sa tepelná odolnosť MEO zvýšila na 77 oC (14,1 % AA), resp. 78 oC (26,8 % AA).
Výstupy:
1. NOVÁK, Igor - CHODÁK, Ivan - SEDLIAČIK, J. - ŽIGO, Ondrej - MATYAŠOVSKÝ, J. - JURKOVIČ, P. Antibacterial modification of polymeric veneers by atmospheric discharge plasma. In Annals of Warsaw University of Life Sciences - SGGW : Forestry and Wood Technology, 2017, no. 98, p. 92-93. ISSN 1898-5912.

2. *NOVÁK, Igor - KRUPA*, Igor - CHODÁK, Ivan - ŽIGO, Ondrej - PREŤO, J. - VANKO, V. Investigation of wood-based polymer composites. In PMA 2017 & SRC 2017 : International Conference on Polymeric Materials in Automotive : 23rd Slovak Rubber Conference : book of proceedings. Techn.red. D. Jochec-Mošková. - Bratislava, Slovakia : Slovak University of Technology, Faculty of Chemical and Food Technology & Polymer Institute of SAS, 2017, p. 172-174. ISBN 978-80-89841-04-2.

3. PAVLINEC, Jiří - CHODÁK, Ivan - NOVÁK, Igor - PREŤO, J. - VANKO, V. Polar groups grafting to metallocene polyolefins designed for hot melt adhesive compositions. In PMA 2017 & SRC 2017 : International Conference on Polymeric Materials in Automotive : 23rd Slovak Rubber Conference : book of proceedings. Techn.red. D. Jochec-Mošková. - Bratislava, Slovakia : Slovak University of Technology, Faculty of Chemical and Food Technology & Polymer Institute of SAS, 2017, p. 179-182. ISBN 978-80-89841-04-2.

4. PAVLINEC, Jiří - CHODÁK, Ivan - NOVÁK, Igor - VANKO, V. - PREŤO, J. Influence of polar groups grafting to metallocene polyolefins on hot melt adhesive properties in packaging industry. In ChemZi : Slovenský časopis o chémii pre chemické vzdelávanie, výskum a priemysel, 2017, roč. 13, č. 1, s. 196-197. ISSN 1336-7242.

3.) Pokročilá LCn-MSn metóda pre charakterizáciu bio-polymérov a produktov ich degradácie. *(Andvanced LC-MSn for characterization of bio-polymers and their degradation products.)*

Zodpovedný riešiteľ:	Alena ŠIŠKOVÁ
Trvanie projektu:	1.01.2016 / 31.12.2018
Evidenčné číslo projektu:	SAV- PAV MAD
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	1 - Poľsko: 1
Čerpané financie:	mobilita

Dosiahnuté výsledky:

Cieľom bilaterálneho slovensko-poľského výskumného projektu je charakterizácia polymérnych systémov získaných v priebehu bio-degradačných procesov vybratých polyesterov za pomoci pokročilých metód kvapalinovej chromatografie a následne hmotnostnou spektrometriou. V hodnotenom období bola venovaná pozornosť separácii a charakterizácii degradačných produktov zo zmesí PLA/PHB. Vzorky boli získané vymývaním do vodného prostredia a následne charakterizované pomocou HPLC vo vodnom prostredí, pričom sa zistilo, že do vody sa z fólií PLA/PHB vymývajú oligoméry oboch zložiek. Frakcie sa študujú v ESI MS laboratóriách v Poľsku.

Výstupy:

1. SIKORSKA, W. - MUSIOŁ, M. - RYDZ, J. - ADAMUS, G. - RYCHTER, P. - ŠIŠKOVÁ, Alena – KOWALCZUK, M. Charakterystyka poliestrów i ich produktów degradacji. Przetwórstwo Tworzyw (Polymer Processing), ISSN 1429-0472, 2017, 5(23), 427-433.

2. SIKORSKA, W. - MUSIOŁ, M. - RYDZ, J. - ADAMUS, G. - RYCHTER, P. - ŠIŠKOVÁ, Alena – KOWALCZUK, M. Charakterystyka poliestrów i ich produktów degradacji z zastosowaniem chromatografii cieczowej. 13. Środkowo-Europejska Konferencja Recykling i Odzysk Innowacyjne Technologie Materiałów Polimerowych Nauka i Przemysł 2017. Białystok-Grodno (Białoruś), 7-9 wrzesień 2017, P20.

3. ŠIŠKOVÁ, Alena - RYDZ, J. - MOSNÁČKOVÁ, Katarína - ECKSTEIN ANDICSOVÁ, Anita - SIKORSKA, W. Advanced characterization of bio-polymers and their degradation products. In Italian-Nordic Polymer Future: booklet of abstract & list of participants [elektronický zdroj]. - Pisa, Italy: Univerista di Pisa, 2017, p. 52.

4. ŠIŠKOVÁ, Alena - ECKSTEIN ANDICSOVÁ, Anita. Chemical functionalization of cellulose materials. In Applied natural sciences 2017 : conference proceedings of the 6th Biennial international scientific conference. - Trnava : University of SS. Cyril and Methodius in Trnava, 2017, p. 50. ISBN 978-80-8105-547-8. (Applied natural sciences 2017 : Biennial international scientific conference).

Programy: COST

4.) Multifunkčné nano-uhlíkové kompozitné materiály: riešenie dvoch hlavných problémov týchto materiálov (1) dostatočná dispergácia nano-uhlíkového plniva, (2) dostatočne silná medzifázová interakcia nano-uhlíkové plnivo a kompozitná matrica. *(Multi-Functional Nano-Carbon Composite Materials Network (MultiComp): two main problems to be solved for composite materials : (1) adequate dispersion of the nano-carbon reinforcement material, and (2) strong enough interfacial bonding between the nano- c)*

Zodpovedný riešiteľ:	Matej MIČUŠÍK
Trvanie projektu:	1.04.2016 / 30.04.2020
Evidenčné číslo projektu:	COST CA15107
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Karlsruhe Institute of Technology, Germany
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	podpora medzinárodnej spolupráce z národných zdrojov: 3150 €

Dosiahnuté výsledky:

V rámci návštevy Dejana Kepiča (STSM stáž) sa pripravili funkcionalizované grafény pomocou ?-iradiácie. Amino-funkcionalizovaný grafén sa pripravil solvotermickou metódou použitím vodného roztoku amoniaku ako zdroja amino skupín (eHOPG/NH3). Všetky vzorky sa potom

charakterizovali XPS a FTIR na určenie typu dusíkových skupín v grafénovej sieti. Výsledky sa momentálne spracúvajú.

5.) Stabilizovaná fotovoltaika ďalšej generácie: objasnenie mechanizmov degradácie organických solárnych článkov komplementárnymi charakterizačnými technikami (StableNextSol). *(Stable Next-Generation Photovoltaics: Unraveling degradation mechanisms of Organic Solar Cells by complementary characterization techniques (StableNextSol).)*

Zodpovedný riešiteľ:	Mária OMASTOVÁ
Trvanie projektu:	1.02.2015 / 31.03.2018
Evidenčné číslo projektu:	MVTS - COST MP 1307
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Fundaci Institut Catal De Nanocicia I Nanotecnologia, Barcelona
Počet spoluriešiteľských inštitúcií:	1
Čerpané financie:	podpora medzinárodnej spolupráce z národných zdrojov: 3150 €

Dosiahnuté výsledky:
Počas uplynulého obdobia sme pokračovali na príprave hybridných materiálov elektrochemickou polymerizáciou pyrolu a pripravené nanokompozity sa porovnávali s chemicky pripravenými hybridmi. Polymerizácia prebiehala na povrchu FTO (Fluorine doped Tin Oxide) skla. Zaoberali sme sa aj charakterizáciou povrchov materiálov pomocou röntgenovej fotoelektrónovej spektroskopie (XPS) a riadkovacej elektrónovej mikroskopie. Z pripravených elektród sa zostavili DSSC a testovala sa ich účinnosť.

Výstupy:

1. MIČUŠÍK, Matej - KULIČEK, Jaroslav - GEMEINER, P. - MIKULA, M. - KIM, S.Y. - OMASTOVÁ, Mária. Polypyrrole based composites for solar cell application. In Polymers and Organic Materials for Electronics and Photonics: Science for Applications : book of abstracts and programme. - Prague, Czech Republic: The Institute of Macromolecular Chemistry, Czech Academy of Sciences, 2017, p. 58. ISBN 978-80-85009-88-0. Typ: AFE.

2. KULIČEK, Jaroslav - MIČUŠÍK, Matej - GEMEINER, P. - MIKULA, M. - OKSUZ, A. U. - OMASTOVÁ, Mária. Carbon nanostructures based conducting composites replacing counter electrodes in solar cells. In StableNextSol COST Action no. MP1307 : Stable Next Generation Photovoltaics: Unravelling Degradation Mechanisms of Organic and Perovskite Solar Cells by Complementary Characterization Techniques: Industry Day: Printed Electronics and Solar Cells. - Lisbon, Portugal : cost, 2017, non p. Názov z obrazovky. Požaduje sa Acrobat Reader. Typ: AFG

3. KULIČEK, Jaroslav - MIČUŠÍK, Matej - GEMEINER, P. - MAJKOVÁ, E. - OMASTOVÁ, Mária. Electrochemicaly prepared polypyrrole hybrids for counter electrode in solar cells. In The 10th International Summit on Stability of Organic and Perovskite Solar Cells : abstracts. - Malta : Malta College of Arts, Science & Technology, 2017, p. 99. Dostupné na internete: <isos10.mcast.edu.mt/isos10>. TypAFG.

4. KULIČEK, Jaroslav - MIČUŠÍK, Matej - GEMEINER, P. - OMASTOVÁ, Mária. Polypyrrole hybrids for simple preparation of counter electrode for solar cells. In Bypos : 7th Bratislava Young Polymer Scientists Wokshop : workshop book. - Bratislava : Young Scientist Council of Polymer Institute SAS, 2017, p. 47. ISBN 978-80-89841-05-9. Typ: AFH

6.) Inovatívne aplikácie vlákien z regenerovanej celulózy. *(Innovative application of regenerated wood cellulose fibers.)*

Zodpovedný riešiteľ:	Alena ŠIŠKOVÁ
Trvanie projektu:	1.05.2013 / 31.05.2017
Evidenčné číslo projektu:	MVTS - COST MP 1205
Organizácia je koordinátorom projektu:	nie
Koordinátor:	SP Wood Technology Sweden
Počet spoluriešiteľských inštitúcií:	1 - Švédsko: 1
Čerpané financie:	Podpora medzinárodnej spolupráce z národných zdrojov: 2313 €

Dosiahnuté výsledky:
V hodnotenom období sa optimalizovali podmienky povrchovej modifikácie filmov z mikrocelulózy a následne aj z nanocelulózy s vhodným plastifikátorom. Mikrocelulózové filmy boli pripravené odlievaním z BmimCl iónovej kvapaliny a filmy z nanocelulózy z vodného roztoku s glycerolom ako plastifikátorom. Následne boli filmy modifikované pomocou azid-alkynovej dipolarárnej cykloadície na prípravu metribuzin-klik-celulózy. Efektívna modifikácia bola potvrdená charakterizáciou pomocou FTIR, TGA a morfológia bola študovaná pomocou SEM. Pomocou SEM sa zistila zmena morfológie povrchu celulózových filmov po modifikácii. Táto zmena napovedá chemickú zmenu. Tiež pomocou TGA sa zistilo, že tepelné a tiež mechanické vlastnosti filmov boli modifikáciou výrazne ovplyvnené, pretože už pri rozpúšťaní mikrokryštalickej celulózy dochádza k zmene kryštalinity celulózy a preto aj k zmene študovaných vlastností.

Výstupy:

1. ŠIŠKOVÁ, Alena - KLEINOVÁ, Angela - KRONEKOVÁ, Zuzana - RYCHTER, P. - KOZMA, E. – ECKSTEIN ANDICSOVÁ, Anita. Straightforward click approach to metribuzin functionalized microcrystalline cellulose films, Submitted in 2017 to Special Issue: Journal of Renewable Materials from 8th Workshop on Green Chemistry and Nanotechnologies in Polymer Chemistry

2. ŠIŠKOVÁ, Alena - CSOMOROVÁ, Katarína - KLEINOVÁ, Angela - OPÁLEK, A. - ECKSTEIN ANDICSOVÁ, Anita. Controlled releases system for agrochemicals on the base of functionalized cellulose. In Frontiers in Polymer Science : fifth international symposium: in assotiation with the journal polymer: abstracts. - Seville, Spain: Elsevier, 2017, non p., [P3.126].

3. ŠIŠKOVÁ, Alena - RYDZ, J. - MOSNÁČKOVÁ, Katarína - ECKSTEIN ANDICSOVÁ, Anita - SIKORSKA, W. Advanced characterization of bio-polymers and their degradation products. In Italian-Nordic Polymer Future: booklet of abstract & list of participants [elektronický zdroj]. - Pisa, Italy: Univerista di Pisa, 2017, p. 52.

Programy: 7RP

7.) ANTIGRPONANO: Antibakteriálne polymérne nanokompozity na báze grafénu.
(ANTIbacterial GRaphene/POlymer NANOcomposite.)

Zodpovedný riešiteľ:	Zoran MARKOVIC
Trvanie projektu:	1.12.2015 / 30.11.2018
Evidenčné číslo projektu:	SASPRO 1237/02/02 (co-funded by Maria Curie

	Actions)
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	71 662,0 €

Dosiahnuté výsledky:

Pripravili sa nové hybridné nanomateriály na báze nano-sieťovaného grafénu s kurkumínom, u ktorých sa potvrdila antimikrobiálna aktivita. Následne sa podarilo aplikovať grafénové alebo karbónové kvantové bodky do polymérnych matríc (silikóny alebo polyuretány) metódou napučiavania. Na pripravených materiáloch sa následne testovala antibakteriálna aktivita. Opakované testy vymývania preukázali stálosť kvantových bodiek na povrchu polymérov. Potvrdila sa fotodynamická aktivita hydrofóbnych kvantových bodiek aj po enkapsulácii do polymérnych reťazcov. Získané polymérne nanokompozity s fotocitlivými uhlíkovými kvantovými bodkami eradikovali Escherichia Coli a Staphylococcus aureus po jednej hodine ožiarenia viditeľným svetlom z LED diódy. Získané výsledky nájdu využitie predovšetkým v medicínskych zariadeniach.

Výstupy:

1. ŠPITÁLSKY, Zdenko – MARKOVIC, Zoran M. Patentová prihláška č. 50017-2017 „Spôsob výroby nanokompozitného materiálu s antibakteriálnymi vlastnosťami, takýto materiál a jeho použitie“, marec 2017, v štádiu posudzovania.

2. MARKOVIĆ, Zoran M. - MATIJAŠEVIĆ, D. M. - PAVLOVIĆ, V. B. - JOVANOVIĆ, S. P. - HOLCLAJTNER-ANTUNOVIĆ, I. D. - ŠPITÁLSKY, Zdenko - MIČUŠÍK, Matej - DRAMIĆANIN, M. D. - MILIVOJEVIĆ, D. D. - NIKŠIĆ, M. P. - TODOROVIĆ MARKOVIĆ, B. M. Antibacterial potential of electrochemically exfoliated graphene sheets. In Journal of Colloid and Interface Science, 2017, vol. 500, p. 30-43. (4.233 - IF2016). ISSN 0021-9797. Typ: ADCA

3. MARKOVIĆ, Zoran M. - KEPIĆ, D. P. - MATIJAŠEVIĆ, D. M. - PAVLOVIĆ, V. B. - JOVANOVIĆ, S. P. - STANKOVIĆ, N. K. - MILIVOJEVIĆ, D. D. - ŠPITÁLSKY, Zdenko - HOLCLAJTNER-ANTUNOVIĆ, I. D. - BAJUK-BOGDANOVIĆ, D. V. - NIKŠIĆ, M. P. - TODOROVIĆ-MARKOVIĆ, B. M. Ambient light induced antibacterial action of curcumin/graphene nanomesh hybrids. In RSC Advances, 2017, vol. 7, p. 36081-36092. (3.108 - IF2016). ISSN 2046-2069. Typ: ADCA

4. JOVANOVIĆ, S. - MARKOVIĆ, Zoran M. - MARKOVIĆ, B. T. Carbon based nanomaterials as agents for photodynamic therapy. In Photodynamic Therapy (PDT). Principles, Mechanisms and Applications. - New York, USA : Nova Science Publishers, Inc., 2017, chapter 2, P. 35-108. ISBN 978-1-53611-912-1. Typ: ABC

5. JOVANOVIĆ, S. P. - MARKOVIĆ, Zoran M. - SYRGIANNIS, Z. - DRAMIĆANIN, M. D. - ARCUDI, F. - LA PAROLA, V. - BUDIMIR, M. D. - MARKOVIĆ, B. M. Todorović. Enhancing photoluminescence of graphene quantum dots by thermal annealing of the graphite precursor. In Materials Research Bulletin, 2017, vol. 93, p. 183-193. (2.446 - IF2016). ISSN 0025-5408. Typ: ADCA

6. PREKODRAVAC, J. R. - MARKOVIĆ, Zoran M. - JOVANOVIC, S. P. - HOLCLAJTNER-ANTUNOVIĆ, I. D. - KEPIĆ, D. P. - BUDIMIR, M. D. - TODOROVIĆ-MARKOVIĆ, B. M. Graphene quantum dots and fullerenol as new carbon sources for single-layer and bi-layer graphene synthesis by rapid thermal annealing method. In Materials Research Bulletin, 2017, vol. 88, p. 114-120. (2.446 - IF2016). ISSN 0025-5408. Typ: ADCA

7. TOMIĆ, S. - JANJETOVIĆ, K. - MIHAJLOVIĆ, D. - MILENKOVIĆ, M. - KRAVIĆ-

STEVOVIĆ, T. - MARKOVIĆ, Zoran M. - TODOROVIĆ-MARKOVIĆ, B. - ŠPITÁLSKY, Zdenko - MIČUŠÍK, Matej - VUCEVIĆ, D. - ČOLIĆ, M. - TRAJKOVIĆ, V. Graphene quantum dots suppress proinflammatory T cell responses via autophagy-dependent induction of tolerogenic dendritic cells. In Biomaterials, 2017, vol. 146, p. 13-28. (8.402 - IF2016). ISSN 0142-9612. Typ: ADCA

8. ŠPITÁLSKY, Zdenko - MARKOVIĆ, Zoran M. - KOVÁČOVÁ, Mária. Nové antibakteriálne materiály s regulovateľným antibakteriálnym účinkom. In Prešporský podnikateľ: mesačník Bratislavskej regionálnej komory SOPK, 2017, roč. X, č. 4, s. 5. ISSN 1337-8295. Typ: BDF

9. ŠPITÁLSKY, Zdenko - MARKOVIĆ, Zoran M. - KOVÁČOVÁ, Mária. Liečba svetlom. In Quark, 2017, roč. 23, č. 9, s. 12-13. ISSN 1337-8422. Typ: BDF

8.) Funkčné hviezdicové architektúry skladajúce sa z cyklodextrínového jadra a bioinšpirovaných syntetických ramien pre všestranné systémy aplikovateľné ako nosiče liečiv. *(Functional Star Architectures Based On Cyclodextrin Cores And Bioinspired Synthetic Arms For Versatile Drug Delivery Systems.)*

Zodpovedný riešiteľ:	Kristián PEPTU
Trvanie projektu:	1.01.2016 / 31.12.2018
Evidenčné číslo projektu:	SASPRO 1237/02/02 (co-funded by Maria Curie
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	65 114,0 €

Dosiahnuté výsledky:

Počas druhého roku riešenia projektu sa pripravili polymérne siete cez tiol-énový kapling medzi tiolovými skupinami v kopolymére na báze polyetylénglykolu a tiomaleátu a dvojitými väzbami v hlavnom reťazci polyglobalidu. Preštudoval sa vplyv pomeru polymérov a celková koncentrácia polymérov na kinetiku sieťovania pomocou reologických meraní a na výsledné napučiavacie vlastnosti vo vode ako i v organických rozpúšťadlách. Morfológia polymérnych sietí sa študovala pomocou SEM analýzy. Pripravené polymérne siete boli úspešne preštudované i vzhľadom na možnosť ich využitia ako nosičov liečiv, kedže dokázali postupne uvoľnovať levoflaxin.

Výstupy:

1. PEPTU, Cristian - BALAN-PORCARASU, M. - ŠIŠKOVÁ, Alena - ŠKULTÉTY, Ľ. - MOSNÁČEK, Jaroslav. Cyclodextrins tethered with oligolactides - green synthesis and structural assessment. In Beilstein Journal of Organic Chemistry, 2017, vol. 13, p. 779-792. (2.337 - IF2016). ISSN 1860-5397.

2. ROTARU, R. - PEPTU, Cristian - SAMOILA, P. - HARABAGIU, V. Preparation of ferroelectric barium titanate through an energy effective solid state ultrasound assisted method. In Journal of American Ceramic Society, 2017, vol. 100, iss. 10, p. 4511-4518. ISSN 0002-7820.

3. PEPTU, Cristian - SAVIN, C. Preparation of porous polymer gels through photoinitiated thiol-ene coupling. The International Conference on Functional Materials and Biomaterials (CFMB2017) November. 17-19, 2017, in Yichang, Hubei, China.(proceedings will be published in AIP Conference Proceedings (ISSN: 0094-243X, E-ISSN: 1551-7616)

4. PEPTU, Cristian - MOSNÁČEK, Jaroslav. Ring opening of cycle esters in the presence of cyclodextrins - A mass spectrometry study. In DVSPM 2017: Danube Vltava Sava Polymer Meeting: book of abstracts. - Vienna, Austria: Institute of Applied Synthetic Chemistry TU Wien,

2017, abstract no. OP-53. ISBN 978-3-9504017-6-9.

5. PEPTU, Cristian - MOSNÁČEK, Jaroslav. Maldi mass spectrometry assesment of oligolactide modified cyclodextrins. In Brochure of the International Workshop on Polymer Science and Polymeric Materials. - Bratislava, Budapest, Zabrze: Centre of Polymer and Carbon Materials Polish Academy of Sciences, Research Centre for Natural Sciences Hungarian Academy of Sciences, Polymer Institute of the Slovak Academy of Sciences, 2017, p. 20. ISBN 978-80-89841-06-6.

9.) CASSETTE: Konjugovaný anti-sense systém pre selektívne a špecifické umlčanie BCR - ABL: Inovatívna stratégia pre liečbu CLM. *(Conjugated Antisense system for Selective and Specific BCR-ABL supprEssion: An innovaTive straTegy for CML treatment.)*

Zodpovedný riešiteľ:	Filip RÁZGA
Trvanie projektu:	1.04.2015 / 31.12.2018
Evidenčné číslo projektu:	SASPRO 0057/01/02 (co-funded by Maria Curie
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	67 140,00 €

Dosiahnuté výsledky:
• Syntéza stavebných blokov a ich oligomerizácia do vyšších oligomérov
• Funkčná modifikácia oligonukleotidov pre potreby konjugačných reakcií
• Príprava prekurzorov pre konjugačné reakcie
• Príprava polymérneho komponentu plánovaného na konjugáciu
• Obojstranná konjugácia koncových nukleotidov do hybridného konštruktu
• Optimalizácia molekulárne biologických metód pre potreby validácie vyvíjaného hybridného systému a vyvíjaných liekových nosičov
• Proof-of-concept
• Uzavretie problematiky Chit/TPP liekových nosičov pre potreby kontrolovaného uvolňovania vyvíjaného hybridného systému
• Syntéza derivátov chitozánu pre prípravu efektívnejších liekových nosičov
• Charakterizácia a in vitro testovanie liekových nosičov na báze chitozánu a jeho derivátov

Výstupy:

1. MAZANCOVÁ, Petra - NÉMETHOVÁ, Veronika - LACÍK, Igor - RÁZGA, Filip. Chitosan-basedparticles: The (forgotten) interplay between process, properties and performance. In Materials Scienceand Engineering C: Materials for Biological Applications, 2017, vol. 71, p. 570-571. (4,164 - IF2016). ISSN 0928-4931.

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3. RÁZGA, Filip - NÉMETHOVÁ, Veronika. Gene expression patterns as predictive biomarkers in hematology-oncology, principal hurdles on the road to the clinic. In Haematologica : the hematology journal, 2017, vol. 102, p. e31-e32. (7,702 - IF2016). ISSN 0390-6078.

4. RÁZGA, Filip- NÉMETHOVÁ, Veronika. Selective therapeutic intervention: A challenge against off-target effects. In Trends in Molecular Medicine, 2017, vol. 23, no. 8, p. 671-674. (10.732 - IF2016). ISSN 1471-4914.

5. NÉMETHOVÁ, Veronika - SVITKOVÁ, B. - MAZANCOVÁ, Petra - BÁBELOVÁ, A. - ŠELC, M. - MORAVČÍKOVÁ, Daniela - KLEŠČÍKOVÁ, Lucia - URSÍNYOVÁ, M. - GÁBELOVÁ, A. - RÁZGA, Filip. Intracellular uptake of magnetic nanoparticles: A focus on physico-chemical characterization and interpretation of in vitro data. In Materials Science and Engineering C: Materials for Biological Applications, 2017, vol. 70, p. 161-168. (4,164 - IF2016). ISSN 0928-4931.

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8. RÁZGA, Filip - NÉMETHOVÁ, Veronika. A method for altering the functional state of MRNA allowing its selective and specific recognition : International Publication Number: WO 2017/065696 A2. International Publication Date: 20.4. 2017. International Application Number: PCT/SK2016/060002. International Filing Date: 12.10. 2016. Priority Data: PP 50065-2015 15.10. 2015. Applicant: Ústav polymérov SAV, Dúbravská cesta 9, 845 41 Bratislava. International Bureau : World Intellectual Property Organization, 2017. 16 s.

9. MAZANCOVÁ, Petra - TREĽOVÁ, Dušana - NÉMETHOVÁ, Veronika - KLEŠČÍKOVÁ, Lucia - LACÍK, Igor - RÁZGA, Filip. Chitosan/TPP particles at physiological pH: do they exist at all? In Biomedizinische Technik, 2017, vol. 62, no. S2, p. 64. (0,915 - IF2016). ISSN 0013-5585.

10. KLEŠČÍKOVÁ, Lucia - NÉMETHOVÁ, Veronika - SORAL, M. - RÁZGA, Filip. A versatile approach for nucleobase modification. In 1st Symposium on Nucleic Acid Modifications : 4-6 September 2017 : book of abstracts. - Mainz, Germany : Institute of Molecular Biology, 2017, p. 82.

11. MAZANCOVÁ, Petra - RÁZGA, Filip - NÉMETHOVÁ, Veronika - LACÍK, Igor. Straightforward but non-trivial concept of chitosan-TTP particles. In Biomedicínske centrum SAV. Genetic toxicology and cancer prevention : book of abstracts. - Bratislava : Cancer research institute, Biomedical research center, 2017, p. 16-17. ISBN 978-80-972247-2-1.(Genetic toxicology and cancer prevention : Bilateral Czech and Slovak meeting).

12. NÉMETHOVÁ, Veronika - RÁZGA, Filip - MAZANCOVÁ, Petra - SVITKOVÁ, B. - BÁBELOVÁ, A. - ŠELC, M. - GÁBELOVÁ, A. Nanoparticle characterization is critical for correct interpretation of biological data. In Biomedicínske centrum SAV. Genetic toxicology and cancer prevention : book of abstracts. - Bratislava : Cancer research institute, Biomedical research center, 2017, p. 18-19. ISBN 978-80-972247-2-1.

13. RÁZGA, Filip - NÉMETHOVÁ, Veronika. Therapy resistance in CML: The complexity that stands behind. In Biomedicínske centrum SAV. Genetic toxicology and cancer prevention : book of abstracts. - Bratislava : Cancer research institute, Biomedical research center, 2017, p. 20. ISBN 978-80-972247-2-1.(Genetic toxicology and cancer prevention : Bilateral Czech and Slovak meeting).

14. GÁBELOVÁ, A. – MESÁROŠOVÁ, M. – BÁBELOVÁ, A. – KOZICS, K. - SEDLÁČKOVÁ,

E. – NÉMETHOVÁ, Veronika – SVITKOVÁ, B. – RÁZGA, Filip – ZÁVIŠOVÁ, V. – KONARECKÁ, M. – URSÍNYOVÁ, M. – ČIAMPOR, F. Interactions of iron oxide nanoparticles with human cells; an in vitro study. Nanocon. 18-20 October 2017, Brno, Czech Republic, Book of Abstracts, D2.

15. TREĽOVÁ, Dušana - RÁZGA, Filip - KRONEKOVÁ, Zuzana - NÉMETHOVÁ, Veronika - UHELSKÁ, Lucia - *RAUS, Vladimír* - MAZANCOVÁ, Petra - *FRAŇO, Milan* - HEYDARI, Abolfazl - KLEŠČÍKOVÁ, Lucia - ROKSTAD, A. M. - MARCHESE, E. - MCGARRIGLE, J. - OBERHOLZER, J. - LACÍK, Igor. Polyelectrolyte microcapsules: A bridge to improved diabetes treatment. In DVSPM 2017 : Danube Vltava Sava Polymer Meeting : book of abstracts. - Vienna, Austria : Institute of Applied Synthetic Chemistry TU Wien, 2017, abstract no. IL-21. ISBN 978-3-9504017-6-9.

16. FRAŇO, Milan - TREĽOVÁ, Dušana - KRONEKOVÁ, Zuzana - KLEŠČÍKOVÁ, Lucia - MAZANCOVÁ, Petra - NÉMETHOVÁ, Veronika - HEYDARI, Abolfazl - UHELSKÁ, Lucia - *RAUS, Vladimír* - RÁZGA, Filip - MCGARRIGLE, J. - OBERHOLZER, J. - LACÍK, Igor. Multicomponent microcapsule for islets encapsulation in diabetes treatment. In 25th International Conference on Bioencapsulation : abstract book. - La Chapelle sur Erde, France : Bioencapsulation Research Group, 2017, p.150-151.

17. KRONEKOVÁ, Zuzana - PELACH, Michal - MAZANCOVÁ, Petra - UHELSKÁ, Lucia - TREĽOVÁ, Dušana - RÁZGA, Filip - NÉMETHOVÁ, Veronika - *RAUS, Vladimír* - MCGARRIGLE, J. J. - OBERHOLZER, J. - ŠIFFALOVIČ, P. - LACÍK, Igor. Structural changes in hudrogel microspheres triggered by in vivo conditions as revealed by confocal raman microscopy. In 14th Confocal Raman Imaging Symposium : abstracts. - Ulm, Germany : WiTec.

18. KRONEKOVÁ, Zuzana - PELACH, Michal - MAZANCOVÁ, Petra - UHELSKÁ, Lucia - TREĽOVÁ, Dušana - RÁZGA, Filip - NÉMETHOVÁ, Veronika - *RAUS, Vladimír* - McGARRIGLE, J. J. - OBERHOLZER, J. - ŠIFFALOVIČ, P. - LACÍK, Igor. Confocal raman microscopy of hydrogel microspheres. Zjazd chemických spoločností, Starý Smokovec, In ChemZi : Slovenský časopis o chémii pre chemické vzdelávanie, výskum a priemysel, 2017, roč. 13, č. 1, s. 108-109. ISSN 1336-7242

19. TREĽOVÁ, Dušana – KRONEKOVÁ, Zuzana – MAZANCOVÁ, Petra – NÉMETHOVÁ, Veronika – KLEŠČÍKOVÁ, Lucia – HEYDARI, Abolfazl – UHELSKÁ, Lucia – *RAUS, Vladimír – FRAŇO, Milan* – RÁZGA, Filip – McGARRIGLE, J. – OBERHOLZER, J. – LACÍK, Igor. Multicomponent microcapsule for islets encapsulation in diabetes treatment. XXV International Conference on Bioencapsulation. 3-6 July 2017, Nantes, France, Book of Abstracts, P29.

20. TREĽOVÁ, Dušana - UHELSKÁ, Lucia - RÁZGA, Filip - NÉMETHOVÁ, Veronika - *RAUS, Vladimír* - MAZANCOVÁ, Petra - KRONEKOVÁ, Zuzana - *FRAŇO, Milan* - KLEŠČÍKOVÁ, Lucia - ROKSTAD, A. M. - MARCHESE, E. - MCGARRIGLE, J. - OBERHOLZER, J. – LACÍK, Igor. Multicomponent polyelectrolyte complex microcapsule for immunoprotection of transplanted pancreatic islets, 46th World Chemistry Congress, 40a Reuni?o Anual da Sociedade Brasileira de Química, and IUPAC 49th General Assembly held from July 7th to 14th, 2017 in S?o Paulo – Brazil.

21. TREĽOVÁ, Dušana - RÁZGA, Filip - KRONEKOVÁ, Zuzana – PELACH, Michal - NÉMETHOVÁ, Veronika - *RAUS, Vladimír* - MAZANCOVÁ, Petra - UHELSKÁ, Lucia - KLEŠČÍKOVÁ, Lucia – HEYDARI, ABOLFAZL – SIFFALOVIC, P. – MAJKOVA, E. - ROKSTAD, A. M. - MCGARRIGLE, J. - OBERHOLZER, J. – LACÍK, Igor. Encapsulated pancreatic islets: the next generation diabetes treatment. “Smart Specialization Strategy in the Field of Biotechnologies in Europe: A Challenge for CEE Region”, Bratislava, Sept 4 – 6 2017.

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Lucia – LACÍK, Igor – RÁZGA, Filip. Dissociation of chitosan/tripolyphosphate complexes into separate components upon pH elevation. Odoslané do Carbohydrate Polymers, (4,811-IF2016).

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24. KRONEKOVÁ, Zuzana - PELACH, Michal - MAZANCOVÁ, Petra - UHELSKÁ, Lucia - TREĽOVÁ, Dušana - RÁZGA, Filip - NÉMETHOVÁ, Veronika - *SZALAI, Szabolcs - CHORVÁT, Dušan* - McGARRIGLE, J. J. - OMAMI, M. - ISA, D. - GHANI, S. - MAJKOVÁ, E. - OBERHOLZER, J. - *RAUS, Vladimír* - ŠIFFALOVIČ, P. - LACÍK, Igor. Structural changes in hydrogel microspheres exposed to in vivo environment as revealed by confocal Raman microscopy. V revízii v Scientific Reports. (4,259 - IF2016).

Programy: International Visegrad Found (IVF)

10.) Bezolovnaté perovskitové solíárne články s dlhodobou stabilitou. *(Pb-free Perovskite solar cells with Long-term stability.)*

Zodpovedný riešiteľ:	Mária OMASTOVÁ
Trvanie projektu:	1.11.2017 / 31.10.2020
Evidenčné číslo projektu:	Projekt V4-Kórea Joint Reseach Program on Chemistry and Chemical Engineering
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Chung-Ang University Seoul
Počet spoluriešiteľských inštitúcií:	1 - Česko: 0, Maďarsko: 0, Kórejská republika: 1, Poľsko: 0
Čerpané financie:	Podpora medzinárodnej spolupráce z národných zdrojov: 2083 €

Dosiahnuté výsledky:
Projekt sa začal riešiť až v novembri 2017.

11.) Školenie pre mladých vedcov zamerané na komunikačné a osobnostné zručnosti. *(Soft Skills Workshop for Young Scientists)*

Zodpovedný riešiteľ:	Anna ZAHORANOVÁ
Trvanie projektu:	1.06.2017 / 30.11.2017
Evidenčné číslo projektu:	21710053
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	4 - Česko: 2, Maďarsko: 1, Poľsko: 1
Čerpané financie:	5 988 € (Vyšegrádsky fond)

Dosiahnuté výsledky:
V rámci projektu sa uskutočnilo medzinárodné päťdňové školenie na pôde Ústavu polymérov SAV. Účastníci zo spoluriešiteľských organizácii sa vyškolili v troch oblastiach - prezentačné zručnosti, akademické písanie v angličine a management projektov. Súčasťou školenia boli tiež prednášky zamerané na mobility v rámci V4 a práca v skupinách na tvorení vlastných miniprojektov.

Výstupy:

1. http://www.polymer.sav.sk/SoftSkill/SoftSkillsTraining%20-%20Booklet.pdf

Programy: Multilaterálne - iné

12.) Progresívna skupina biomateriálov. *(The Advanced Biomaterials Group (ABIOG).)*

Zodpovedný riešiteľ:	Zuzana KRONEKOVÁ
Trvanie projektu:	1.09.2016 / 31.03.2017
Evidenčné číslo projektu:	21620101
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Cracow University of Technology, Poland
Počet spoluriešiteľských inštitúcií:	4 - Česko: 2, Maďarsko: 1, Poľsko: 1
Čerpané financie:	-

Dosiahnuté výsledky:
Projekt ABIOG bol zameraný na získanie a/alebo prehĺbenie spolupráce medzi zúčastnenými inštitúciami z krajín V4. Cieľ tohto projektu bol splnený, v náväznosti sa podával nový V4 projekt na organizovanie konferencie (Workshop on Green Chemistry and Nanotechnologies in Polymer Chemistry), ktorá sa uskutočnila v Prahe, Česká republika.

Výstupy:

1. Brochure of ABIOG Partners: 4th Meeting of ABIOG Project Managements Committee & Workshop. Warsaw, Poland.

13.) Stanovenie rýchlostných konštánt a modelovanie súčasných a v budúcnosti študovaných polymerizačných procesov a systémov v BASF. *(Kinetic coefficients and models for existing and future polymerization processes and systems at BASF.)*

Zodpovedný riešiteľ:	Igor LACÍK
Trvanie projektu:	1.09.2015 / 31.08.2018
Evidenčné číslo projektu:	projekt BASF AG, Ludwigshafen, Nemecko
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	1 - Nemecko: 1
Čerpané financie:	35 000,00 €

Dosiahnuté výsledky:
Vstúpili sme do problematiky štúdia kinetiky a mechanizmu nabitých monomérov pulznou laserovou polymerizáciou v prepojení na gélovú permeačnú chromatografiu. Okrem homopolymerizácie sa tiež venujeme kopolymerizácii so zahrnutím monomérov s rôznym typom náboja vedúcim ku vzniku polyamfolytov, monomérov s povrchovo-aktívnymi vlastnosťami a monomérov z prírodných zdrojov s možnosťou tvorby superabsorbentov.

Výstupy:

1. LUK, S. B. - KOLLÁR, Jozef - CHOVANCOVÁ, Anna - MRLÍK, M. - LACÍK, Igor - MOSNÁČEK, Jaroslav - HUTCHINSON, R. A. Superabsorbent hydrogels made from bio-sourced butyrolactone monomer in aqueous solution. In Polymer Chemistry, 2017, vol. 8, p. 6039-6049. (5.375 - IF2016). ISSN 1759-9954.

2. ROONEY, T. R. - CHOVANCOVÁ, Anna - LACÍK, Igor - HUTCHINSON, R. A. Pulsed laser

studies of cationic reactive surfactant radical propagation kinetics. In Polymer : the International Journal for the Science and Technology of Polymers, 2017, vol. 130, p. 39-49. (3,684 - IF2016). (2017 - Current Contents). ISSN 0032-3861. Podiel: 0,5 (F).

14.) Kompozity na báze vodivých polymérov. *(Composites based on conductive polymers.)*

Zodpovedný riešiteľ:	Matej MIČUŠÍK
Trvanie projektu:	1.01.2017 / 31.12.2018
Evidenčné číslo projektu:	DS-2016-0027
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	-

Dosiahnuté výsledky:
Pripravili sa kompozity na báze vodivého polyméru (polypyrol a polyanilín) a lignínu. Tieto hybridné častice sa potom použijú do polymérnej matrice a budú sa testovať na elektromagnetické tienenie. Časť výsledkov sa momentálne pripravuje na zaslanie do vedeckého časopisu.

15.) Farbivom senzibilizované solárne články na báze pevných perovskitových elektrolytov. *(Dye-sensitized solar cell based on perovskite solid-state electrolyte (DOPE))*

Zodpovedný riešiteľ:	Mária OMASTOVÁ
Trvanie projektu:	1.09.2016 / 31.08.2018
Evidenčné číslo projektu:	Projekt KONNECT Joint Call on “Resources and Sustainability”
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Chung-Ang University, Korea
Počet spoluriešiteľských inštitúcií:	4 - Slovensko: 2, Turecko: 2
Čerpané financie:	Podpora medzinárodnej spolupráce z národných zdrojov: 12480 €

Dosiahnuté výsledky:
Boli pripravené hybridné elektródy na báze uhlíkových nanotrubičiek a polypyrolu. Pre porovnanie sa taktiež pripravili elektródy z čistého polypyrolu a porovnávala sa ich účinnosť v solárnych článkoch typu DSSC a v článkoch s perovskitovými štruktúrami. Taktiež sa optimalizovali vlastnosti hybridných elektród variáciou ich zloženia a a použitím rôznych typov tenzidov. Pripravili sa elektródy na báze grafénu, ktorý sa naniesol ITO prípadne FTO sklo a následná sa polymerizoval pyrol, chemicky prípadne elektrochemicky. Tento materiál sa testuje o Kórejského partnera a vyhodnocuje sa účinnosť perovskitových článkov s týmito elektródami.

Výstupy:

1. MIČUŠÍK, Matej - KULIČEK, Jaroslav - GEMEINER, P. - MIKULA, M. - KIM, S.Y. - OMASTOVÁ, Mária. Polypyrrole based composites for solar cell application. In Polymers and Organic Materials for Electronics and Photonics: Science for Applications : book of abstracts and programme. - Prague, Czech Republic : The Institute of Macromolecular Chemistry, Czech Academy of Sciences, 2017, p. 58. ISBN 978-80-85009-88-0. Typ: AFE.

2. KULIČEK, Jaroslav - MIČUŠÍK, Matej - GEMEINER, P. - OMASTOVÁ, Mária. Polypyrrole

hybrids for simple preparation of counter electrode for solar cells. In Bypos : 7th Bratislava Young Polymer Scientists Wokshop : workshop book. - Bratislava : Young Scientist Council of Polymer Institute SAS, 2017, p. 47. ISBN 978-80-89841-05-9. Typ: AFH.

16.) Nano-vlákna pripravené elektrostatickým zvlákňovaním pre pre bio- inšpirované kompozitné materiály a ich inovatívne priemyselné aplikácie. *(Electrospun nano-fibres for bio-inspired composite materials and innovative industrial applications.)*

Zodpovedný riešiteľ:	Mária OMASTOVÁ
Trvanie projektu:	1.05.2012 / 31.05.2017
Evidenčné číslo projektu:	MVTS - COST MP 1206
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Kemyk, 7000 Eisenstadt
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	Podpora medzinárodnej spolupráce z národných zdrojov: 1313 €

Dosiahnuté výsledky:

Polykaprolaktónové/polypyrolové (PCL/PPy) vlákna sa pripravili s použitím originálneho prístupu elektrostatickým zvlákňovaním roztoku PCL a pyrolového monoméru. Prítomnosť pyrolového monoméru vo vnútri vlákien bola potvrdená analýzou ToF-SIMS. Pripravené vlákna boli ponorené do roztoku oxidačného činidla obsahujúceho pyrolový monomér a aniónový tenzid. Bol študovaný efekt vplyvu podmienok prípravy na prípravu elektricky vodivých netkaných textílií s rôznym pomerom PCL k pyrolovému monoméru. Prítomnosť polypyrolového povlaku na pripravenej PCL subštruktúre bola overená infračervenou spektroskopiou s Fourierovou transformáciou (FTIR), röntgenovou fotoelektrónovou spektroskopiou (XPS) a morfologickou analýzou. Povrchové vlastnosti pripravených vodivých vlákien boli testované meraním kontaktných uhlov. Pripravené nanovlákna boli homogénne potiahnuté polypyrolom a vzorky obsahujúce najmenej 40% hmotnostných pyrolového monoméru po potiahnutí dosiahli vodivosť vyššiu ako 1 S/cm.

Výstupy:

1. ČÍKOVÁ, Eliška - MIČUŠÍK, Matej - ŠIŠKOVÁ, Alena - PROCHÁZKA, Michal - OMASTOVÁ, Mária. Conducting polycaprolactone/polypyrrole nanofiber mats prepared by electrospinning. In Electrospin CY - 2017 : Conference/MC1206 final MC meeting : abstract book. - Nicosia, Cyprus : University of Cyprus, 2017, p. 77. Názov z obrazovky. Požaduje sa Adobe Acrobat. Typ: AFG

2. ČÍKOVÁ, Eliška - ŠIŠKOVÁ, Alena - MIČUŠÍK, Matej - CAPÁKOVÁ, Z. - PROCHÁZKA, Michal - OMASTOVÁ, Mária. Electroactive scaffolds based on the modified electrospun poly(epsilon-caprolactone) fibres. In 8th Workshop on Green Chemistry and Nanotechnologies in Polymer Chemistry : book of abstracts and programme. - Prague, Czech Republic : IMC, 2017, p. 37. ISBN 978-80-85009-89-7. Typ: AFG

3. ČÍKOVÁ, Eliška - ŠIŠKOVÁ, Alena - MIČUŠÍK, Matej - CAPÁKOVÁ, Z. - PROCHÁZKA, Michal - OMASTOVÁ, Mária. Conducting polymeric composite based on the modified electrospun poly(epsilon-caprolactone) fibers. In Proceedings in SciFed Materials Research Letters: 2nd Global Congress & Expo on Materials Science and Nanoscience. - Valencia, Spain : Scientific Fedaration, 2017, p.99. Typ: AFG

4. ČÍKOVÁ, Eliška - MIČUŠÍK, Matej - HUMPOLÍČEK, P. - OMASTOVÁ, Mária. Polycaprolactone/polypyrrole nanofiber mats for bioengineering. In 17. Osterreichische Chemietage. - Salzburg, Osterreich : Universitat Salzburg, 2017, abstract no. OP-40. Názov z

obrazovky. Požaduje sa Adobe Acrobat. Dostupné na internete: <www.chemietage.at>.

17.) Antibakteriálne polymérne nanokompozity z uhlíkových nanočastíc. *(Antibacterial polymeric nanocomposites on the base of carbon nanomaterials.)*

Zodpovedný riešiteľ:	Zdenko ŠPITÁLSKY
Trvanie projektu:	1.01.2017 / 31.12.2018
Evidenčné číslo projektu:	DS-2016-0021
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	2 - Česko: 1, Srbsko: 1
Čerpané financie:	-

Dosiahnuté výsledky:
Pripravila sa séria polymérnych kompozitov na báze silikónu a polyuretánu plnených uhlíkovými nanobodkami. U všetkých pripravených kompozitov sa preukázala silná antibakteriálna aktivita.

Výstupy:

1. KOVÁČOVÁ, Mária - MARKOVIĆ, Zoran M. - DANKO, Martin - BARTOŠ, Josef - ŠVAJDLENKOVÁ, Helena - ŠPITÁLSKY, Zdenko. Quantum dots as nanofiller in polymer composites and their antibacterial effects for potential application in construction of ambulances and other equipment. In PMA 2017 & SRC 2017 : International Conference on Polymeric Materials in Automotive : 23rd Slovak Rubber Conference : book of proceedings. - Bratislava, Slovakia : Slovak University of Technology, Faculty of Chemical and Food Technology & Polymer Institute of SAS, 2017, p. 155-156. ISBN 978-80-89841-04-2.(PMA 2017 & SRC 2017 : International Conference on Polymeric Materials in Automotive : Slovak Rubber Conference). Typ: AFH

2. KOVÁČOVÁ, Mária - MARKOVIĆ, Zoran M. - HUMPOLÍČEK, P. - LEHOCKÝ, M. - KUBÁT, P. - ŠVAJDLENKOVÁ, Helena - ŠPITÁLSKY, Zdenko. Antimikrobiálne polymérne nanokompozity. In ChemZi : Slovenský časopis o chémii pre chemické vzdelávanie, výskum a priemysel, 2017, roč. 13, č.1, s. 191-192. ISSN 1336-7242. Typ: AFH

Programy: Bilaterálne - iné

18.) Bezpečnosť a kvalita potravín v nanotechnológii. *(Safety and quality of food in nanotechnology.)*

Zodpovedný riešiteľ:	Zuzana BENKOVÁ
Trvanie projektu:	1.09.2016 / 31.07.2017
Evidenčné číslo projektu:	NORTE-01-0145-FEDER-000011
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Univerzita v Porte, Portugalsko
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	-

Dosiahnuté výsledky:
Riešenie projektu bolo zamerané na využitie uhlíkových nanorúrok v biochemických procesoch. Pomocou molekulovo-dynamických a ab-initio výpočtov sa skúmali vplyvy rôznych modifikácií

nanorúrok na ich rozpustnosť vo vode a ich interakciu s biologicky aktívnymi látkami. Rovnako sa študoval aj vplyv priemeru nanorúrok na interakciu nanorúrok s molekulami rôznej veľkosti a afinity k vode.

19.) Luminiscenčné hodvábne nanovlákna ako platformy pre snímacie zariadenia. *(Luminescent silk nanofibers as platforms for sensing devices.)*

Zodpovedný riešiteľ:	Martin DANKO
Trvanie projektu:	1.01.2016 / 31.12.2017
Evidenčné číslo projektu:	SAV-CNR Taliansko
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	1 - Taliansko: 1
Čerpané financie:	-

Dosiahnuté výsledky:
Projekt je zameraný na prípravu senzorických molekúl s fluorescenčnými vlastnosťami a na ich imobilizáciu v mikro/nano vláknach hodvábu. Optimalizovali sa podmienky elektrostatického zvlákňovania hodvábu a pripravovali sa vodorozpustné farbivá na báze perylén-diimidu. Syntetický postup zahŕňa 3 kroky kondenzácie s etyléndiamínom, substitúcie a kvaternizácie dusíka bróm-etanolom a esterifikácia anhydridom kys. metakrylovej. Imobilizáciou týchto molekúl vo vláknach sa získa materiál s možnými senzorickými vlastnosťami.

Výstupy:

1. ECKSTEIN ANDICSOVÁ, Anita - DANKO, Martin - MOSNÁČEK, Jaroslav. Amphiphilic copolymers based particles with potential uses in drug delivery systems. In Frontiers in Polymer Science : fifth international symposium: in assotiation with the journal polymer: abstracts. - Seville, Spain : Elsevier, 2017, non p., [P1.129]. Názov z obrazovky. Požaduje sa Adobe Acrobat Reader DC.

20.) Ekologicky nezávadné multifunkčné polyméry. *(Bio-friendly multifunctional polymers.)*

Zodpovedný riešiteľ:	Jaroslav MOSNÁČEK
Trvanie projektu:	1.01.2016 / 31.12.2018
Evidenčné číslo projektu:	SK-HU MAD
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	1 - Maďarsko: 1
Čerpané financie:	-

Dosiahnuté výsledky:
V rámci projektu sa študovala degradácia PLA/PHB a PLA/PHB/sadze zmesí za podmienok ich možnej aplikácie ako mulčovacích fólií ako i štúdium foto a hydrolytickej degradácie za laboratórnych podmienok. Taktiež sa pokračovalo v štúdiu vývoja superabsorbérnych hydrogélov na báze monomérov z obnoviteľných zdrojov. Hypervetvené stabilizátory sa študovali pre stabilizáciu poly(vinyl chloridu).

Výstupy:

1. KASZA, G. - STUMPHAUSER, T. - NÁDOR, A. - SZARKA, G. - DOMJÁN, A. - MOSNÁČEK, Jaroslav - IVÁN, B. Hyperbranched polyglycerol nanoparticles based

multifunctional, nonmigrating hindered phenolic macromolecular antioxidants: Synthesis, characterization and its stabilization effect on poly(vinyl chloride). In Polymer : the International Journal for the Science and Technology of Polymers, 2017, vol. 124, no., p. 210-218. (3.684 - IF2016). (2017 - Current Contents). ISSN 0032-3861.

21.) Antibakteriálne úpravy polymérov. *(Antibacterial modification of polymers.)*

Zodpovedný riešiteľ:	Igor NOVÁK
Trvanie projektu:	1.01.2017 / 31.12.2017
Evidenčné číslo projektu:	
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	1 - Česko: 1
Čerpané financie:	-

Dosiahnuté výsledky:
Skúmala sa cytokompatibilita a biologická funkcionalita kyseliny polymliečnej (PLA) za účelom jej použitia ako implantátu. Povrch PLA bol použitím niekoľkostupňovej modifikačnej metódy povrchovo upravený rádiofrekvenčnou plazmou a následne bol očkovaný kyselinou akrylovou. Na povrch očkovaného PLA sa následne fyzikálne alebo kovalentne naviazal D-glukozamín (G1cN). Bolo zistené, že imobilizácia G1cN na očkovaný PLA povrch zlepšuje schopnosti buniek z hľadiska adhézie a proliferácie. Ukázalo sa, že bunky na modifikovanom PLA povrchu vytvárajú súvislú populáciu bez významných zmien v cytoskeletone. Okrem toho sa ukázalo, že kovalentne naviazaný G1cN zabezpečuje vyššiu cytokompatilitu v porovnaní G1cN, ktorý je naviazaný fyzikálne.

Výstupy:

1. SWILEM, A. E. - LEHOCKÝ, M. - HUMPOLÍČEK, P. - KUCEKOVÁ, Z. - NOVÁK, Igor - MIČUŠÍK, Matej - EL-REHIM, H. A. Abd - HEGAZY, El-Sayed A. - HAMED, A. A. - KOUSAL, J. Description of d-glucosamine immobilization kinetics onto poly(lactic acid) surface via a multistep physicochemical approach for preparation of novel active biomaterials. In Journal of Biomedical Materials Research. Part A, 2017, vol. 105A, p. 3176-3188. (3.076 - IF2016). ISSN 1549-3296.

2. NOVÁK, Igor - CHODÁK, Ivan - SEDLIAČIK, J. - ŽIGO, Ondrej - MATYAŠOVSKÝ, J. - JURKOVIČ, P. Antibacterial modification of polymeric veneers by atmospheric discharge plasma. In Annals of Warsaw University of Life Sciences - SGGW: Forestry and Wood Technology, 2017, no. 98, p. 92-93. ISSN 1898-5912.

3. NOVÁK, Igor - SEDLIAČIK, J. - CHODÁK, Ivan - KRYŠTOFIAK, T. - KLEINOVÁ, Angela - *POPELKA, Anton* - MATYAŠOVSKY, J. - JURKOVIČ, P. Bacteriostatic pre-treatment of poly(lactic acid) veneers by radio-frequency plasma. In Wood - Science - Economy: 2th International Scientific Conference: proceedings. - Poznan, Poland: Wood Technology Institute, 2017, p. 76.

22.) Fotovoltaické a senzorické vlastnosti grafénu a uhlíkových nanotrubičiek funkcionalizovaných plazmou a chemicky. *(Photovoltaic and sensor properties of plasma and chemical functionalized graphene and carbon nanotubes.)*

Zodpovedný riešiteľ:	Mária OMASTOVÁ

Trvanie projektu:	1.12.2014 / 30.11.2017
Evidenčné číslo projektu:	SAS - TÜBITAK JRP 2014 /2
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	1 - Turecko: 1
Čerpané financie:	Podpora medzinárodnej spolupráce z národných zdrojov: 22 877 €

Dosiahnuté výsledky:

Pripravovali sa nanokompozity na báze vodivého polyméru a uhlíkového nanoplniva ako protielektródy do farbivom senzibilizovaných solárnych článkov (DSSC). Nanokompozity na báze uhlíkových nanotrubičiek (MWCNT), grafénu (GR) a polyfuranu (PFu) boli pripravené metódou plazmovej polymerizácie (RF-plazma). Kompozity PFu/MWCNT a PFU/GR boli pripravované pri výkone plazmového generátora 40 W. Povrchová analýza bola urobená pomocou infračervenej spektroskopie (FTIR), röntgenovej fotoelektrónovej spektroskopie (XPS) a skenovacej elektrónovej mikroskopie (SEM). Prítomnosť polyfuranu v pripravených vzorkách bola potvrdená pomocou XPS, FTIR a SEM. DSSC pripravené s protielektródami PFu/GR a PFu/MWCNT preukázali zvýšenú katalytickú aktivitu a účinnosť. Účinnosť DSSC, keď bola Pt elektróda nahradená MWCNT alebo kompozitom PFu / MWCNT, bola nízka. Lepšie výsledky sa dosiahli, keď sa použila protielektróda na báze PFu/GR. Maximálna účinnosť DSSC bola s protielektródou PFu/GR 5,06 %, čo je oveľa vyššia ako účinnosť 2,13 % v článku pomocou GR počítacej elektródy. Výsledok ukazuje, že jednoduchá a účinná plazmová metóda môže poskytnúť veľkú výhodu vo výrobe vodivých kompozitov na báze polymérov na použitie v lacných a účinných DSSC.
V druhej časti projektu sa pripravovali nanokompozity na báze polyanilínu (PANI) a polypyrolu (PPy) a ako plnivo bol použitý grafén (GR). Nanokompozity sa tiež pripravovali pomocou plazmového generátora s výkonom 40 W. Morfologická charakterizácia nanokompozitov bola uskutočnená pomocou skenovacej elektrónovej mikroskopie (SEM) a ukázala, že PANI a PPy pokryli povrch GR. Povrchové vlastnosti GR nanokompozitov boli charakterizované pomocou Fourierovej transformačnej infračervenej spektroskopie (FTIR), röntgenovej fotoelektrónovej spektroskopie (XPS) a SEM analýzy. Pripravené kompozity sa použili v DSSC ako materiály pre protielektródu a študoval sa výkon nových článkov. Účinnosť solárnych článkov bola 5,4 % a 5,6 % pre protielektródy na báze PANI/GR a PPy/GR.

Výstupy:

1. COGAL, S. - ERTEN ELA, S. - COGAL, G. C. - MIČUŠÍK, Matej - OMASTOVÁ, Mária - OKSUZ, A. U. Plasma-enhanced modification of multiwalled carbon nanotube with conducting polymers for dye sensitized solar cells. Polym. Compos.. doi:10.1002/pc.23983. V tlači.

2. COGAL, S. - ERTEN ELA, S. - CELIK, J. - KULIČEK, Jaroslav - MIČUŠÍK, Matej - OMASTOVÁ, Mária – OKSUZ, A. U. Plasma-based preparation of polyaniline/graphene and polypyrrole/graphene composites for dye-sensitized solar cells as counter electrodes. Odoslané Journal of Macromolecular Science, Part A: Pure and Applied Chemistry.

3. KULIČEK, Jaroslav - MIČUŠÍK, Matej - GEMEINER, P. - MIKULA, M. - OKSUZ, A. U. - OMASTOVÁ, Mária. Carbon nanostructures based conducting composites replacing counter electrodes in solar cells. In StableNextSol COST Action no. MP1307 : Stable Next Generation Photovoltaics: Unravelling Degradation Mechanisms of Organic and Perovskite Solar Cells by Complementary Characterization Techniques: Industry Day: Printed Electronics and Solar Cells. - Lisbon, Portugal : COST, 2017, non p. Názov z obrazovky. Požaduje sa Acrobat Reader.

4. KULIČEK, Jaroslav - PROCHÁZKA, Michal - MIČUŠÍK, Matej - GEMEINER, P. - MIKULA, M. - OKSUZ, A. U. - OMASTOVÁ, Mária. Nové typy protielektród v solárnych článkoch. In

ChemZi : Slovenský časopis o chémii pre chemické vzdelávanie, výskum a priemysel, 2017, roč. 13, č. 1, s. 193. ISSN 1336-7242. Typ: AFH

23.) Antibakteriálne polymérne nanokompozitné vlákna z uhlíkových nanomateriálov. *(Antibacterial polymeric nanocomposites fibers based on carbon nanomaterials.)*

Zodpovedný riešiteľ:	Zdenko ŠPITÁLSKY
Trvanie projektu:	1.11.2017 / 31.12.2018
Evidenčné číslo projektu:	SK-SRB-2016-0038
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	Podpora medzinárodnej spolupráce z národných zdrojov: 1657 €

Dosiahnuté výsledky:
Projekt sa začal riešiť až v novembri 2017.

Programy: European Regional Development Fund (ERDF)

24.) Odpad z makro plastov v a pozdĺž Dunaja. *(Macro plastic waste in and along the Danube.)*

Zodpovedný riešiteľ:	Mária OMASTOVÁ
Trvanie projektu:	1.09.2017 / 30.09.2020
Evidenčné číslo projektu:	INTERREG V-A SK-AT / 2017 / TP / 01
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Univerzita prírodnych zdrojov a života vo Viedni – Odbor vody- atmosféry a životného prostredia
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	-

Dosiahnuté výsledky:
Začalo sa s prípravou metodiky pre kvalitatívnu analýzu a dáta ohľadom kompozície plastového odpadu. Analyzujú sa vzorky z prvého zberu odpadu na rakúskej strane.

Programy: ERANET

25.) M2 Neural: Multifunkčné materiály na rozhraní neurónových systémov. *(M2Neural: Multifunctional Materials for advanced Neural interfaces.)*

Zodpovedný riešiteľ:	Igor LACÍK
Trvanie projektu:	1.11.2014 / 31.08.2017
Evidenčné číslo projektu:	M2Neutral
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Scuola Superiore Sant'Anna
Počet spoluriešiteľských inštitúcií:	1 - Taliansko: 1
Čerpané financie:	Podpora medzinárodnej spolupráce z národných zdrojov:

16710 €

Dosiahnuté výsledky:
Posledný rok riešenia projektu bol zameraný na charakterizáciu pripravených zwitteriónových hydrogélových vrstiev. Vyvinula sa nová metóda charakterizácie hydrogélov v napučanom stave, keď sa na vizualizáciu hydrogélov použil protein IgG značený fluorescenčnou farbičkou Alexa 488 neprenikajúci do štruktúry hydrogélu. Zistilo sa, že pripravené hydrogély majú v napučanom stave hrúbku 10-30 µm. Ďalším dôležitým výsledkom bola modulácia uvoľňovania protizápalového liečiva Dexametazónu z nanočastíc pomocou ultrazvukových pulzov. Zistilo sa, že pôsobením ultrazvuku dochádzalo k urýchleniu uvoľňovania liečiva z nanočastíc do roztoku v porovnaní so spontánnym uvoľňovaním.

Výstupy:

1. ŠRÁMKOVÁ, Petra - ZAHORANOVÁ, Anna - KRONEKOVÁ, Zuzana - ŠIŠKOVÁ, Alena - KRONEK, Juraj. Poly(2-oxazoline) hydrogels by photoinduced thiol-ene "click" reaction using diffrent dithiol crosslinkers. In Journal of Polymer Research, 2017, vol. 24, art. no. 82, 13p. (1,615 - IF2016). ISSN 1022-9760.

2. SALGARELLA, A.R. - ŠRÁMKOVÁ, Petra - ZAHORANOVÁ, Anna - KRONEK, Juraj - MENCIASSI, A. - LACÍK, Igor – RICOTTI, L. Ultrasound-mediated drug release from micelles based on poly(2-oxazoline) terpolymers and triblock copolymer. 28th Annual Conference of European Society on Biomaterials (ESB2017), Athens, Greece, September 4-8, 2017, OP-210.

3. ZAHORANOVÁ, Anna - TREĽOVÁ, Dušana - SALGARELLA, A. - RICOTTI, L. - GIUDETTI, G. - CUTRONE, A. – ŠRÁMKOVÁ, Peta - *CHORVÁT, Dušan* - HAŠKO, D. - CANALE, C. - MICERA, S. - KRONEK, Juraj - MENCIASSI, A. – LACÍK, Igor. In DVSPM 2017 : Danube Vltava Sava Polymer Meeting : book of abstracts. - Vienna, Austria : Institute of Applied Synthetic Chemistry TU Wien, 2017, abstract no. OP-8. ISBN 978-3-9504017-6-9.

Programy: Iné

26.) Nová generácia viackomponentných PMCG mikrokapsúl s kontrolovaným povrchom pre vyhnutie sa imunitnej odpovedi po transplantácii. *(New generation PMCG multicomponent microcapsule with tailored biointerface to avoid immune response after transplantation.)*

Zodpovedný riešiteľ:	Igor LACÍK
Trvanie projektu:	1.09.2017 / 31.08.2019
Evidenčné číslo projektu:	2-SRA-2018-521-S-B
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	3 - Česko: 1, Nórsko: 1, USA: 1
Čerpané financie:	-

Dosiahnuté výsledky:
Tento projekt získaný od enkapsulačného konzorcia Juvenile Diabeteas Research Foundation chce využiť preukázaný potenciál polyelektrolytových mikrokapsúl tvorených z alginátu sodného, sodnej soli sulfátu celulózy a poly(metylén-co-kyanoguanidínu). Vytvorila sa knižnica syntetizovaných polymérov, ktoré sa testujú z pohľadu tvorby a in vitro stability mikrokasúl. Následne sa tieto mikrokapsuly implantujú intraperitoneálne najprv do myších modelov (aj s enkapsulovanými ostrovčekmi) s následným plánom testovania v makakoch (s alogénnou transplantáciou ostrovčekov). Prvé skúsenosti v myších modeloch (C57bl/6 imunokompetentný model) sú pozitívne a získali sme mikrokapsuly na báze syntetizovaného sulfátu celulózy, ktoré sú tolerované a odolné

voči fibrotickému obrastaniu v tomto modeli.

27.) Viackomponentné mikrokapsuly pre alogénnu transplantáciu pankreatických ostrovčekov v predklinickom modeli nehumánnych primátov. *(Multicomponent microcapsules for allogeneic islet transplantation in a comprehensive, preclinical non-human primate model.)*

Zodpovedný riešiteľ:	Igor LACÍK
Trvanie projektu:	1.11.2014 / 31.12.2017
Evidenčné číslo projektu:	JDRF 2-SRA-2014-288-Q-R
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Juvenile Diabetes Research Foundation, University of Illinois Chicago
Počet spoluriešiteľských inštitúcií:	2
Čerpané financie:	-

Dosiahnuté výsledky:
V tejto poslednej fáze projektu sa študovali podmienky tvorby polyelektrolytových mikrokapsúl, ktorých základom sú alginát sodný (SA), sodná soľ sulfátu celulózy (SCS) a poly(metylén-co-kyanoguanidín) (PMCG). Pracovalo sa s komerčnými polymérmi pri použití rôznych enkapsulačných protokolov pre získanie informácie, či tieto polyméry sú schopné poskytnúť mikrokapsuly tolerované pre intraperitoneálnu implantáciu do myších modelov a primátov. Pokiaľ čo v myších modeloch sme získali pozitívne dáta, v makakoch mikrokapsuly obrastali fibrotickým tkanivom, čo je nežiadúce. Niektoré z týchto experimentov sa ešte ukončujú. Na základe týchto experimentiov sme sa rozhodli vytvoriť mikrokapsuly z novo-syntetizovaných polymérov, čo je podstatou projektu získaného v roku 2017.

Výstupy:

1. GRAVASTRAND, C. - HAMAD, S. - FURE, H. - STEINKJER, B. - RYAN, L. - OBERHOLZER, J. - LAMBRIS, J. D. - LACÍK, Igor - MOLLNES, T. E. - ESPEVIK, T. - BREKKE, O.-L. - ROKSTAD, A. M.. Alginate microbeads are coagulation compatible, while alginate microcapsules activate coagulation secondary to complement or directly through FXII. In Acta biomaterialia, 2017, vol. 58, p. 158-167. (6,319 - IF2016). ISSN 1742-7061.

2. KRAJČOVIČ, T. - BUČKO, M. - VIKARTOVSKÁ, A. - LACÍK, Igor - UHELSKÁ, Lucia - *CHORVÁT, Dušan* - NEDĚLA, V. - TIHLAŘÍKOVÁ, E. - GERICKE, M. - HEINZE, T. - GEMEINER, P. Polyelectrolyte complex beads by two-step process for improved performance of viable whole-cell Baeyer-Villiger monoxygenase by immobilization. In Catalysts 2017, vol. 7 (353), p.1-12 (3,082 - IF2016). ISSN 2073-4344.

3. KRONEKOVÁ, Zuzana - PELACH, Michal - MAZANCOVÁ, Petra - UHELSKÁ, Lucia - TREĽOVÁ, Dušana - RÁZGA, Filip - NÉMETHOVÁ, Veronika - SZALAI, Szabolcs, CHORVÁT, Dušan -McGARRIGLE, J. J. - OMAMI, M. - ISA, D. - GHANI, S. - MAJKOVÁ, E. - OBERHOLZER, J. - RAUS, Vladimír - ŠIFFALOVIČ, P. - LACÍK, Igor. Structural changes in hydrogel microspheres exposed to in vivo environment as revealed by confocal Raman microscopy. V revízii v Scientific Reports. (4,259 - IF2016).

4. TREĽOVÁ, Dušana - RÁZGA, Filip - KRONEKOVÁ, Zuzana - NÉMETHOVÁ, Veronika - UHELSKÁ, Lucia - *RAUS, Vladimír* - MAZANCOVÁ, Petra - *FRAŇO, Milan* - HEYDARI, Abolfazl - KLEŠČÍKOVÁ, Lucia - ROKSTAD, A. M. - MARCHESE, E. - MCGARRIGLE, J. - OBERHOLZER, J. - LACÍK, Igor. Polyelectrolyte microcapsules: A bridge to improved diabetes treatment. In DVSPM 2017 : Danube Vltava Sava Polymer Meeting : book of abstracts. - Vienna, Austria : Institute of Applied Synthetic Chemistry TU Wien, 2017, abstract no. IL-21. ISBN 978-3-

9504017-6-9.

5. KRONEKOVÁ, Zuzana - PELACH, Michal - MAZANCOVÁ, Petra - UHELSKÁ, Lucia - TREĽOVÁ, Dušana - RÁZGA, Filip - NÉMETHOVÁ, Veronika - *RAUS, Vladimír* - McARRIGLE, J. J. - OBERHOLZER, J. - ŠIFFALOVIČ, P. - LACÍK, Igor. Structural changes in hudrogel microspheres triggered by in vivo conditions as revealed by confocal raman microscopy. In 14th Confocal Raman Imaging Symposium : abstracts. - Ulm, Germany : WiTec.

28.) Syntéza dobre definovaných nových kopolymérov pomocou živých polymerizačných metód a pokročilých chromatografických techník. *(The synthesis of well-defined new copolymers using living polymerization methods and advanced chromatographic techniques.)*

Zodpovedný riešiteľ:	Jaroslav MOSNÁČEK
Trvanie projektu:	1.01.2015 / 31.12.2017
Evidenčné číslo projektu:	SAV-MOST Taiwan JRP 2014
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	1 - Taiwan: 1
Čerpané financie:	Podpora medzinárodnej spolupráce z národných zdrojov: 25000 €

Dosiahnuté výsledky:
V rámci spoločného výskumného projektu s dvomi univerzitami v Taiwane sa riešili dve rôzne témy:
1) pokračovalo sa vo vývoji fotochemicky indukovanej radikálovej polyadície s prenosom atómu za účelom prípravy polymérov s hydrolyzovateľným hlavným reťazcom, pričom cieľom bolo znížiť množstvo katalyzátora na báze medi.
2) študovala sa možnosť prípravy triblokových amfifilných kopolymérov predĺžením diblokového kopolyméru polystyrén-b-polyizoprénu.

Výstupy:

1. DANKO, Martin - MOSNÁČEK, Jaroslav. Ring-opening polymerization of gamma-butyrolactone and its derivatives: A review. In POLIMERY-W, 2017, vol. 62, no. 4, p. 272-282. (0.778 - IF2016). ISSN 0032-2725.

2. OSICKA, J. - ILČÍKOVÁ, Markéta - MRLIK, M. - MINAŘÍK, A. - PAVLINEK, V. - MOSNÁČEK, Jaroslav. The impact of polymer grafting from a graphene oxide surface on its compatibility with a PDMS matrix and the light-induced actuation of the composites. In Polymers : Open Access Polymer Science Journal, 2017, vol. 9, no. 7, art.no. 264. (3.364 - IF2016). ISSN 2073-4360.

3. BORSKÁ, Katarína - MORAVČÍKOVÁ, Daniela - MOSNÁČEK, Jaroslav. Photochemically induced ATRP of (meth)acrylates in the presence of air: The effect of light intensity, ligand, and oxygen concentration. In Macromolecular Rapid Communications, 2017, vol. 38, iss. 13, art.no. 1600639. (4.265 - IF2016). ISSN 1022-1336..

Projekty národných agentúr

Programy: VEGA

1.) Porovnanie mechanizmov účinku nanočastíc zlata a magnetitu na jednotlivé typy renálnych buniek. *(Mechanisms of gold and magnetic nanoparticle effects on renal cells.)*

Zodpovedný riešiteľ:	Andrea BÁBELOVÁ
Zodpovedný riešiteľ v organizácii SAV:	Filip RÁZGA
Trvanie projektu:	1.01.2015 / 31.12.2018
Evidenčné číslo projektu:	2/0113/15
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Biomedicínske centrum SAV
Počet spoluriešiteľských inštitúcií:	1
Čerpané financie:	-

Dosiahnuté výsledky:

• Uzavretie problematiky Chit/TPP liekových nosičov pre potreby kontrolovaného uvolňovania vyvíjaného hybridného systému
• Syntéza derivátov chitozánu pre prípravu efektívnejších liekových nosičov
• Optimalizácia molekulárne biologických metód pre potreby validácie vyvíjaného hybridného systému a vyvíjaných liekových nosičov
• Syntéza a charakterizácia značených chemických zlúčenín určených na povrchovú úpravu nanočastíc na báze magnetitu
• Charakterizácia veľkosti a koloidnej stability nanočastíc na báze zlata a magnetitu
• Charakterizácia veľkosti a koloidnej stability nanočastíc na báze titánu, kremíka, selénu a striebra
• In vitro testovanie nanočastíc na báze magnetitu, zlata, striebra, titánu, selénu, kremíka s cieľom preskúmať ich akútnu cytotoxicitu

Výstupy:

1. MAZANCOVÁ, Petra - NÉMETHOVÁ, Veronika - LACÍK, Igor - RÁZGA, Filip. Chitosan-based particles: The (forgotten) interplay between process, properties and performance. In Materials Science and Engineering C: Materials for Biological Applications, 2017, vol. 71, p. 570-571. (4,164 - IF2016). ISSN 0928-4931.

2. NÉMETHOVÁ, Veronika - SVITKOVÁ, B. - MAZANCOVÁ, Petra - BÁBELOVÁ, A. - ŠELC, M. - MORAVČÍKOVÁ, Daniela - KLEŠČÍKOVÁ, Lucia - URSÍNYOVÁ, M. - GÁBELOVÁ, A. - RÁZGA, Filip. Intracellular uptake of magnetic nanoparticles: A focus on physico-chemical characterization and interpretation of in vitro data. In Materials Science and Engineering C: Materials for Biological Applications, 2017, vol. 70, p. 161-168. (4,164 - IF2016). ISSN 0928-4931.

3. BULIAKOVÁ, B. - MESÁROŠOVÁ, M. - BÁBELOVÁ, A. - ŠELC, M. - NÉMETHOVÁ, Veronika - ŠEBOVÁ, L. - RÁZGA, Filip - URSÍNYOVÁ, M. - CHALUPA, I. - GÁBELOVÁ, A.. Surface-modified magnetite nanoparticles act as aneugen-like spindle poison. In Nanomedicine : nanotechnology, biology and medicine, 2017, vol. 13, no. 1, p. 69-82. (5,720 - IF2016). ISSN 1549-9634.

4. MAZANCOVÁ, Petra - TREĽOVÁ, Dušana - NÉMETHOVÁ, Veronika - KLEŠČÍKOVÁ, Lucia - LACÍK, Igor - RÁZGA, Filip. Chitosan/TPP particles at physiological pH: do they exist at all? In Biomedizinische Technik, 2017, vol. 62, no. S2, p. 64. (0,915 - IF2016). ISSN 0013-5585.

5. MAZANCOVÁ, Petra - RÁZGA, Filip - NÉMETHOVÁ, Veronika - LACÍK, Igor. Straightforward but non-trivial concept of chitosan-TTP particles. In Biomedicínske centrum SAV. Genetic toxicology and cancer prevention : book of abstracts. - Bratislava : Cancer research institute, Biomedical research center, 2017, p. 16-17. ISBN 978-80-972247-2-1.(Genetic toxicology and cancer prevention : Bilateral Czech and Slovak meeting).

6. NÉMETHOVÁ, Veronika - RÁZGA, Filip - MAZANCOVÁ, Petra - SVITKOVÁ, B. -

BÁBELOVÁ, A. - ŠELC, M. - GÁBELOVÁ, A.. Nanoparticle characterization is critical for correct interpretation of biological data. In Biomedicínske centrum SAV. Genetic toxicology and cancer prevention : book of abstracts. - Bratislava : Cancer research institute, Biomedical research center, 2017, p. 18-19. ISBN 978-80-972247-2-1.

7. GÁBELOVÁ, A. – MESÁROŠOVÁ, M. – BÁBELOVÁ, A. – KOZICS, K. - SEDLÁČKOVÁ, E. – NÉMETHOVÁ, Veronika – SVITKOVÁ, B. – RÁZGA, Filip – ZÁVIŠOVÁ, V. – KONARECKÁ, M. – URSÍNYOVÁ, M. – ČIAMPOR, F. Interactions of iron oxide nanoparticles with human cells; an in vitro study. Nanocon. 18-20 October 2017, Brno, Czech Republic, Book of Abstracts, D2.

8. MAZANCOVÁ, Petra – NÉMETHOVÁ, Veronika – TREĽOVÁ, Dušana – KLEŠČÍKOVÁ, Lucia – LACÍK, Igor – RÁZGA, Filip. Dissociation of chitosan/tripolyphosphate complexes into separate components upon pH elevation. Odoslané do Carbohydrate Polymers, (4,811-IF2016).

2.) Charakterizácia komplexných organických látok v mezo-škálovej priestorovej limitácii pomocou externých próbovacích techník. *(Characterization of complex organic compounds under meso-scale spatial restriction using external probing techniques.)*

Zodpovedný riešiteľ:	Josef BARTOŠ
Trvanie projektu:	1.01.2016 / 31.12.2019
Evidenčné číslo projektu:	2/0030/16
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	5 676 €

Dosiahnuté výsledky:

1. m-TOL: BDS Relaxačná dynamika polárneho protické modelového systému m-toluidinu (m-TOL) bola detailne vyšetrená pomocou širokopásmovej dielektrickej spektroskopie (BDS). Primárny α- a sekundárny β-relaxačný mód boli merané v širokom teplotnom intervale kvapalného stavu nad teplotou sklovitého prechodu Tg. V prípade α-relaxácie sa kriticky otestovala séria 6 fenomenologických 3-, 4- a 6-parametrových fenomenologických a teoretických modelov s nálezom, že tzv. dvojporiadkovoparametrový (TOP) model poskytuje nielenže najpresnejší popis α-relaxačného času od teploty, ale podáva aj fyzikálne vysvetlenie diskontinuitných zmien spektrálneho tvarového parametra od teploty v termínoch tuhých a kvapalných domén v neusporiadanej fáze. Konečne, originálne sa detegoval a charakterizoval sekundárny β-relaxačný mód v kvapalnom stave a odhalil ne-Arrhéniovský charakter jeho relaxačného času.

2.séria n-alkánov ako prototypy poly(etylén)u: ESR vs.PALS vs.VISC

V sérii 6 normálnych alkánov (n-hexan, C6 n-nonan, C9, n-undekan, C11, n-tri dekan, C13, n-hexadekan, C16 a n-nonadekan, C19) ako prototypov lineárneho poly(etylén)u bola vyšetrená rotačná dynamika spinovej sondy TEMPO pomocou ESR techniky. Okrem obvyklých zmien v reorientácii a voľnom objeme spojených s fázovými prechodmi pri teplote topenia Tm a tuhého prechodu pri Tss sa zistila nová koincidencia pri charakteristických ESR a PALS teplotách $TX1^{fast} \cong Tb1^{solid} <$ Tm, Tss. Fenomenologická analýza viskozitných dát n-alkánov v kvapalnom stave pomocou mocninového zákona indikuje existenciu lokálne neusporiadaných oblastí v dominantne usporiadaných n-alkánoch, v ktorých prebieha dynamická zmena pri tzv. prechodovej teplote $T_X^{\eta} \cong T_{X1}^{fast} \cong T_{b1}^{solid}$

3.CHX: ESR

V nadväznosti na ESR, DSC a PALS štúdium modelovej kryštalickej organickej substancie tvorenej

kvázi-sférickými molekulami: cyclohexan (CHX) [H. Švajdlenková et al. Chem.Phys.Letts. 643, 98 (2016)] sa dokončilo kombinované ESR a DSC štúdium CHX uväzneného v sérii silikagélových (SG) matríc s rôznou veľkosťou pórov od 60 Å do 300 Å ako aj s rôznymi povrchmi: originálny tj. solvofóbny vs. modifikovaný tj. solvofilný. Zistilo sa, že dramatické spomalenie rotačnej dynamiky spinovej sondy TEMPO v CHX a jej relatívne slabá závislosť od veľkosti póru v originálnych SG matriciach sú podstatne redukované v modifikovanej SG matrici po substitúcii Si-OH skupín alkylovými Si-OR skupinami čo súvisí s elimináciou preferenčnej interakcie polárnej spinovej sondy TEMPO s pôvodnými silanolovými skupinami na povrchu SG matríc. V závere, štrukturálno-dynamická charakterizácia nepolárnych médií v uväznenom stave pomocou ESR techniky za použitia spinovej sondy TEMPO je aplikovateľná v prípade solvofilných matríc.

Výstupy:

1. ŠVAJDLENKOVÁ, Helena - RUFF, A. - LUNKENHEIMER, P. - LOIDL, A. - BARTOŠ, Josef. Primary alpha and secondary beta relaxation dynamics of meta-toluidine in the liquid state investigated by broandband dielectric spectroscopy. In Journal of Chemical Physics, 2017, vol. 147, art. no. 084506. (2.965 - IF2016). (2017 - Current Contents, WOS, SCOPUS). ISSN 0021-9606.

2. BARTOŠ, Josef - ZGARDZINSKA, B. - ŠVAJDLENKOVÁ, Helena - LUKEŠOVÁ, Miroslava - ZALESKI, R. PALS and ESR detection of the dynamic crossover in the amorphous phase of the crystalline n-alkanes. In 12th International Workshop on Positron and Positronium Chemistry: PPC 12: Book of abstracts: programme. - Lublin, Poland: Maria Curie-Sklodowska University, 2017, p. O16.

3. BARTOŠ, Josef - CORSARO, C. - ŠVAJDLENKOVÁ, Helena - LUKEŠOVÁ, Miroslava. ESR evidence of the dynamic crossover in the supercooled liquid states of a series of crystalline n-alkanes. In Spin-2017: The 8th Conference on Nitroxide Radicals: Book of abstracts. - Padova, Italy: University of Padova, 2017, p. 53.

4. LUKEŠOVÁ, Miroslava - VALIČ, S. - ŠVAJDLENKOVÁ, Helena - REUTER, D. - CARIČ, D. - MACOVÁ, Eva - BEREK, Dušan - LOIDL, A. - BARTOŠ, Josef. Spin probe dynamics of cyclohexane bulk and confined geometry. In XXVII International EPR Seminar: programme and abstracts. - Dresden, Germany: Leibniz Institute for Solid State and Materials Research, 2017, non p.

3.) Interakcie povrchovov modifikovaných polyetylénoxidov s voľnými polymérmi. *(Interactions of surfaces modified by poly(ethylene oxide) with free polymers.)*

Zodpovedný riešiteľ:	Zuzana BENKOVÁ
Trvanie projektu:	1.01.2016 / 31.12.2019
Evidenčné číslo projektu:	2/0098/16
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	4581 €

Dosiahnuté výsledky:

Riešenie projektu bolo zamerané na molekulovo-dynamické simulácie povrchov pokrytých polyetylénoxidovými reťazcami a ich interakciu s oligopeptidmi. Skúmal sa vplyv vody na tieto interakcie ako aj vplyv rôznej afinity oligopeptidov k vode a zmeny hustoty pokrytia povrchu. Cieľom bolo určiť úlohu vody v týchto procesoch. Interakcie sa kvantifikovali zo závislosti sily

pôsobiacej medzi modifikovaným povrchom a daným oligopeptidom. V centre záujmu bola aj zmena konformácie oligopeptidov vyvolaná interakciami s pokrytými povrchmi.

4.) Kompozitné a smart nanočastice a nanomateriály: príprava, modifikácia a kolektívne vlastnosti. *(Composite and smart nanoparticles and nanomaterials: preparation, modification and collective properties.)*

Zodpovedný riešiteľ:	Ignác CAPEK
Trvanie projektu:	1.01.2014 / 31.12.2017
Evidenčné číslo projektu:	2/0040/14
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	3 620 €

Dosiahnuté výsledky:
Zvláštna pozornosť je venovaná štúdiu kinetiky prípravy strieborných nanočastíc a polyméru v procese fotolýzy striebornej soli, fotoiniciátora a akrylamidu. Fotolýza viedla k tvorbe nanokompozitov na báze striebra a polyméru a ich veľkosť rastie s postupom reakcie, resp. polymerizácie. Súčasne sa tiež sledovali závislosti rýchlosti polymerizácie od času, resp. konverzie. Krivka rýchlosti polymerizácie od konverzie je popísaná dvoma nestacionárnymi intervalmi. Počiatočný vzrast rýchlosti sa pripísal akumulácii koncentrácie reakčných centier. A naopak pokles rýchlosti s konverziou sa pripísal intra- a intermolekulovému prenosu reaťazca. Sledovali sme tiež prípravu nanočastíc so štruktúrou jadro-obal na báze vzácnych kovov a biomolekúl. Takto pripravené koloidy sa vyznačujú zlepšenými koloidnými vlastnosťami a netradične vysokou funkčnosťou, spôsobenou blízkosťou funkčne rozdielnych zložiek. S použitím vodorozpustného monoméru sa dosiahne požadovaná povrchová funkcionalizácia častíc a aj príprava nanočastíc v jednostupňovej reakcii pozostávajúcej z redukcie kovovej soli a stabilizácie kovových nanočastíc tvoreným polymérom (napr. kyseliny akrylovej a akrylamidu).

Výstupy:

1. CAPEK, Ignác. Gold nanoparticles in cancer cell lines. In International Journal of General Medicine and Pharmacy, 2016, special Edition, p. 1-14. ISSN 2319-3999.

2. CAPEK, Ignác. Kinetic study of acrylamide photopolymerization in the presence of silver salt. In Polymer Bulletin, 2017, vol. 74, no. 11, p. 4577-4593. (1.430 - IF2016). (2017 - Current Contents). ISSN 0170-0839.

5.) Nanoštruktúra (bio)makromolekulových systémov stiesnených v nanokanáloch. *(Structural transitions of confined semi-flexible macromolecules.)*

Zodpovedný riešiteľ:	Peter CIFRA
Trvanie projektu:	1.01.2016 / 31.12.2019
Evidenčné číslo projektu:	2/0055/16
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	4 581 €

Dosiahnuté výsledky:
Rovnovážne konformačné správanie semiflexibilných makromolekulových reťazcov v poli cylindrických nanopostov bolo vyšetrované molekulovými simuláciami. V porovnaní s predošlými štúdiami obmedzovaných makromolekúl v jednotlivých kanáloch, alebo v iných obmedzeniach, tu dochádza k súčasnému obmedzovaniu a k prerozdeľovaniu reťazca medzi viacero intersticiálnych kvázi-cylindrických objemov medzi nanopostami. K podstatným zisteniam patrí, že tuhšie, menej ohybné reťazce penetrujú medzi nanopostami ľahšie a zaberajú viacero intersticiálnych objemov. Tento záver potvrdzuje aj pohľad cez voľno-energetickú penaltu pri prechode úzkou štrbinou medzi nanopostami, ktorá je predpovedaná nižšia pre tuhšie reťazce. Pole nanopostov je možné reprezentovať semi-kvantitatívne ako kombináciu intersticiálneho objemu s geometriou cylindrického kanálu a priechodu medzi týmito priestormi v tvare úzkej štrbiny. Ak penalta voľnej energie v týchto dvoch obmedzeniach je rovnaká dochádza práve ku nástupu penetrácie pomedzi nanoposty. Týmto spôsobom je možné vysvetliť správanie makromolekúl v takomto obmedzení a podarilo sa vysvetlit aj druhé podstatné a zaujímavé pozorovanie kde vystieranie reťazcov v smere pozdĺž nanopostov pri zahusťovaní nanopostami s konštantnou šírkou štrbiny medzi postami je nemonotónne. Tento prechod v správaní je dôsledkom súťaže medzi vystieraním v intersticiálnom objeme a penetráciou medzi nanoobjemami. Aj tento prechod je citlivý na zmeny v tuhosti reťazca.

Výstupy:

1. BENKOVÁ, Zuzana - RIŠPANOVÁ, Lucia - CIFRA, Peter. Effect of chain stiffness for semiflexible macromolecules in array of cylindrical nanoposts. In Journal of Chemical Physics, 2017, vol.147, art.no. 134907. (2.965 - IF2016). (2017 - Current Contents, WOS, SCOPUS). ISSN 0021-9606

6.) Príprava a štúdium polymérov a polymérnych materiálov z obnoviteľných zdrojov. *(Development and study of polymers and polymeric materials based on renewable resources.)*

Zodpovedný riešiteľ:	Martin DANKO
Trvanie projektu:	1.01.2017 / 31.12.2020
Evidenčné číslo projektu:	2/0158/17
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	23 595 €

Dosiahnuté výsledky:
Projekt je zameraný za prípravu polyesterov pomocou polymerizácie s otvorením kruhu využitím laktónov z obnoviteľných zdrojov. Pokračovala príprava funkčných polyesterov na báze ε-kaprolaktónu a α-metylén-ɤ-butyrolaktónu (P(MBL-co-CL), ktorých násobná väzba pozdĺž reťazca dovoľuje ich modifikáciu. V podmienkach ROP iniciáciou Al(OiPr)3 v teplotnom rozmedzí -78 – 20°C sme pripravili polyméry s Mn = 20 000-45 000 g mol-1 (Đ = 1.15-1.30) do teploty 0°C a obsahom MBLv kopolyméri 5 – 25 mol %. Následne sa uskutočnili modelové modifikácie pomocou tiol-énovej reakcie v miernych podmienkach foto-aktivácie s N-acetyl cysteínom a termo-aktivácie s fluorescenčným tiolom benzotioxantónu, ktoré potvrdili funkčnosť polyeteru.
Vodorozpustný 4-hydroxy-4-metyl-2-metylén butanoát sodný (SHMeMB) sa pripravil hydrolýzou ɤ-metyl-α-metylén-ɤ-butyrolaktónu (MeMBL), monoméru z obnoviteľných zdrojov. Ten sa následne použil pri kopolymerizácii s akrylamidom (AM) v rôznych mólových pomeroch. Výsledný hydrogél sa vyznačuje superabsorpčnými vlastnosťami so stupňom napučania v ultračistej vode v rozmedzí 6700– 59000 %. Nastaviteľné mechanické vlastnosti hydrogélov významne ovplyvňuje pomer komonomérov a stupeň presietenia. Štúdia bola obohatená taktiež o výpočet rýchlostných

konštánt jednotlivých monomérov pomocou in-situ NMR a PLP-SEC analýzy.

Výstupy:

1. MOSNÁČKOVÁ, Katarína - DANKO, Martin - ŠIŠKOVÁ, Alena - FALCO, L. M. - JANIGOVÁ, Ivica - CHMELA, Štefan - VANOVČANOVÁ, Z. - OMANÍKOVÁ, L. - CHODÁK, Ivan - MOSNÁČEK, Jaroslav. Complex study of the physical properties of a poly(lactic acid)/poly(3-hydroxybutyrate) blend and its carbon black composite during various outdoor and laboratory ageing conditions. In RSC Advances, 2017, vol. 7, p. 47132-47142. (3.108 - IF2016). ISSN 2046-2069.

2. LUK, S. B. - KOLLÁR, Jozef - CHOVANCOVÁ, Anna - MRLÍK, M. - LACÍK, Igor - MOSNÁČEK, Jaroslav - HUTCHINSON, R. A. Superabsorbent hydrogels made from bio-sourced butyrolactone monomer in aqueous solution. In Polymer Chemistry, 2017, vol. 8, p. 6039-6049. (5.375 - IF2016). ISSN 1759-9954.

3. BONDAREV, Dmitrij - ZEDNÍK, J.Influence of covalent structure and molecular weight distribution on the optical properties of alternating copolymers and oligomers and oligomers with 1,2,3-triazole and 1,3,4-oxadiazole side groups. In Polymer : the International Journal for the Science and Technology of Polymers, 2017, vol. 124, p. 107-116. (3.684 - IF2016). (2017 - Current Contents). ISSN 0032-3861.

4. DANKO, Martin - *ĎURKÁČOVÁ, Slávka* - MOSNÁČEK, Jaroslav. Tulipaline a and epsilon-caprolactone ROC - polyesters with double bond functionality. In ICBP 2017 with BCRS - Taiwan Annual Meeting. - Yuan Ze, Taiwan: Yuan Ze University, 2017, p. 120.

5. BALOGH, Róbert - DANKO, Martin - MOSNÁČEK, Jaroslav - ECKSTEIN ANDICSOVÁ, Anita - KOZMA, E. Thiazolo[5,4-D]thiazoles as promising building blocks for semiconducting materials. In Bypos: 7th Bratislava Young Polymer Scientists Wokshop: workshop book. - Bratislava: Young Scientist Council of Polymer Institute SAS, 2017, p. 59. ISBN 978-80-89841-05-9.

6. BALOGH, Róbert - ECKSTEIN ANDICSOVÁ, Anita - DANKO, Martin. Tiazolo [5,4-d] tiazoly - nádejné stavebné jednotky pri syntéze komponentov organických polovodičov. In PREVEDA: interaktívna konferencia mladých vedcov. - Bratislava: Občianske združenie PREVEDA, 2017, abstract no. 1557. ISBN 978-80-972360-1-4.(Interaktívna konferencia mladých vedcov 2017).

7. DANKO, Martin - *ĎURKÁČOVÁ, Slávka* - MOSNÁČEK, Jaroslav. Functional polyesters from tulipaline a and epsilon-caprolactone. In ChemZi: Slovenský časopis o chémii pre chemické vzdelávanie, výskum a priemysel, 2017, roč. 13, č. 1, s. 110-111. ISSN 1336-7242

7.) Nové elektro- a foto-aktívne deriváty pre elektroniku a polymerizačné systémy. *(New electro- and photo- active derivatives for small molecules and polymer systems.)*

Zodpovedný riešiteľ:	Anita ECKSTEIN
Trvanie projektu:	1.01.2017 / 31.12.2020
Evidenčné číslo projektu:	2/0161/17
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	10 055 €

Dosiahnuté výsledky:

Projekt je zameraný na prípravu a štúdium elektro- a foto- aktívnych zlúčenín s cielenými spektrálnymi vlastnosťami vhodnými pre charakterizáciu, monitorovanie a modifikáciu vlastností donorno-akceptorných (D-A) derivátov a rôznych typov polymérnych systémov. Makromolekuly na báze perylénu a tiazolo[5,4-d]tiazolu boli zosyntetizované a študované. Pripravili sa substituované deriváty 2,2'-bitiofénu ako p-konjugované mosty v D-A molekule pre solárne bunky. Fotofyzikálne a elektrochemické vlastnosti týchto linkerov sa prezentovali s využitím kombinovaného teoretického a experimentálneho prístupu. Nové deriváty ako 1,6- a 1,7-fluorenylový disubstituovaný perylén diimid boli syntetizované a charakterizované ako potenciálne materiály pre OLEDy.

Výstupy:

1. OSICKA, J. - ILČÍKOVÁ, Markéta - MRLIK, M. - MINAŘÍK, A. - PAVLINEK, V. - MOSNÁČEK, Jaroslav. The impact of polymer grafting from a graphene oxide surface on its compatibility with a PDMS matrix and the light-induced actuation of the composites. In Polymers : Open Access Polymer Science Journal, 2017, vol. 9, no. 7, art.no. 264. (3.364 - IF2016). ISSN 2073-4360

2. BALOGH, Róbert - DANKO, Martin - MOSNÁČEK, Jaroslav - ECKSTEIN ANDICSOVÁ, Anita - KOZMA, E. Thiazolo[5,4-D]thiazoles as promising building blocks for semiconducting materials. In Bypos: 7th Bratislava Young Polymer Scientists Wokshop: workshop book. - Bratislava: Young Scientist Council of Polymer Institute SAS, 2017, p. 59. ISBN 978-80-89841-05-9.

3. BALOGH, Róbert - ECKSTEIN ANDICSOVÁ, Anita - DANKO, Martin. Tiazolo [5,4-d] tiazoly - nádejné stavebné jednotky pri syntéze komponentov organických polovodičov. In PREVEDA: interaktívna konferencia mladých vedcov. - Bratislava: Občianske združenie PREVEDA, 2017, abstract no. 1557. ISBN 978-80-972360-1-4.(Interaktívna konferencia mladých vedcov 2017).

8.) Relaxačné a časovo závislé efekty pri deformácii viacfázových systémov na báze polymérnej matrice. *(Relaxation and time dependent effects at deformation of multiphase systems with polymeric matrix.)*

Zodpovedný riešiteľ:	Ivan CHODÁK
Trvanie projektu:	1.01.2014 / 31.12.2017
Evidenčné číslo projektu:	2/0108/14
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	6 167 €

Dosiahnuté výsledky:

Značná časť prác sa týkala starnutia termoplastického škrobu (TPS), kde sa tieto efekty prejavujú veľmi výrazne v krátkodobom i v dlhodobom časovom intervale. Sledovali sa zmeny kryštalického podielu a s tým súvisiacich mechanických vlastností a porovnávali sa aj údaje z dynamicko-mechanickej analýzy (DMTA). Z hľadiska nových poznatkov boli veľmi prospešné práce týkajúce sa použitia NMR v tuhej fáze, kde sa sledovala priamo pohyblivosť makromolekúl pre rôzne systémy TPS. Značný vplyv má konkrétny plastifikátor, v závislosti od energie vytvorených vodíkových väzieb.

Výstupy:

1. IVANIČ, František - JOCHEC MOŠKOVÁ, Daniela - JANIGOVÁ, Ivica - CHODÁK, Ivan.

Physical properties of starch plasticized by a mixture of plasticizers. In European Polymer Journal, 2017, vol. 93, p. 843-849. (3.531 - IF2016). ISSN 0014-3057

2. PORUBSKÁ, M. - SZOLLOS, O. - JANIGOVÁ, Ivica - JOMOVÁ, K. - CHODÁK, Ivan. Crosslinking of polyamide-6 initiated by proton beam irradiation. In Radiation Physics and Chemistry, 2017, vol. 133, p. 52-57.

3. IVANIČ, František - CHODÁK, Ivan. Effect of plasticizers mixture of physical properties of thermoplastic starch. In DVSPM 2017 : Danube Vltava Sava Polymer Meeting : book of abstracts. - Vienna, Austria : Institute of Applied Synthetic Chemistry TU Wien, 2017, abstract no. PO-15. ISBN 978-3-9504017-6-9.

4. CHODÁK, Ivan – PEKAŘOVÁ, S. - KOUTNÝ, M. - KUCHARCZYK, P. – SEDLAŘÍK, V. – JANIGOVÁ, Ivica – SEDNIČKOVÁ, Michaela - JOCHEC-MOŠKOVÁ, Daniela. Effect of biodegradation on physical properties of PLA-based blends. In Proceedings 9th European Symposium on Biopolymers, p. 43-44. Toulouse, 5.-7.07.2017

5. CHODÁK, Ivan - HEYDARI, Abolfazl - SEDNIČKOVÁ, Michaela. Structure of carbon black physical network determined by electrical conductivity during cyclic deformation of vulcanized rubber mixture. In EUROFILLERS 2017 : Polymer Blends : abstract book. - Heraklion, Crete : University of Crete, 2017, p. 93.

6. CHODÁK, Ivan - HEYDARI, Abolfazl - SEDNIČKOVÁ, Michaela. Characterization of dynamic changes of filler network in rubber vulcanizate from electrical conductivity during uniaxial or cyclic deformation. In Proceedings RubberCon, Praha 23.-25.5.2017

9.) Predoxidácia polymérov na ich ceste k biodegradácii. *(Pre-oxidation of polymers on their route to biodegradation.)*

Zodpovedný riešiteľ:	Ivica JANIGOVÁ
Trvanie projektu:	1.01.2015 / 31.12.2017
Evidenčné číslo projektu:	1/0122/15
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	4 625 €

Dosiahnuté výsledky:

Pokračovalo sa v štúdiu predoxidácie polymérnych materiálov. UV žiareniu bol vystavený LDPE. Existencia dvoch píkov na DSC záznamoch potvrdzuje degradáciu a tvorbu menej dokonalých kryštalitov vplyvom degradácie. IČ spektroskopia ukázala karbonylové a hydroxylové skupiny. Starnutie PLA s UV žiarením a následným vložením do kompostu ukázalo nárast Tg hodnoty s dĺžkou pôsobenia UV žiarenia, čo odpovedá vzniku menej dokonalých kryštalitov. DSC analýza PLA v komposte ukázala vyššie hodnoty termických charakteristík, čo naznačuje tvorbu dokonalejších kryštalitov v komposte v porovnaní s UV žiarením.

Výstupy:

1. JANIGOVÁ, Ivica - CSOMOROVÁ, Katarína - FIEDLEROVÁ, Agnesa - RYCHLÁ, Lýdia - RYCHLÝ, Jozef - ŠLOUF, M. Termické vlastnosti kyseliny polymliečnej po aplikácii UV žiarenia. In ChemZi: Slovenský časopis o chémii pre chemické vzdelávanie, výskum a priemysel, 2017, roč. 13, č.1, s. 189-190. ISSN 1336-7242.

10.) Polyméry na báze 2-oxazolínov pre cielený transport liečiv a kontrolovanú adhéziu buniek. *(Polymers based on 2-oxazolines for targeted drug delivery and controlled cell adhesion.)*

Zodpovedný riešiteľ:	Juraj KRONEK
Trvanie projektu:	1.01.2015 / 31.12.2017
Evidenčné číslo projektu:	2/0163/15
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	4 871 €

Dosiahnuté výsledky:
V poslednom roku riešenia projektu sme sa podarilo pripraviť nové typy nanočastíc pomocou usporiadania blokových a gradientových kopolymérov na báze poly(2-oxazolínov). V prvom typom boli na prípravu nanočastíc využité ABA a BAB triblokové kopolyméry s termosenzitívnymi vlastnosťami. Ďalší typ nanočastíc sa pripravil z gradientových kopolymérov obsahujúcich superhydrofóbne dodecyloxyfenylové skupiny. Tento typ kopolymérov tvoril častice s unikátnou časovou stabilitou v rôznych fyziologických médiách a bol využitý na enkapsuláciu kurkumínu ako prírodnej účinnej látky pre liečbu rôznych ochorení. Taktiež sme sfinalizovali štúdium hydrogélov s nastaviteľnými mechanickými vlastnosťami využitím tiol-énovej „click“ reakcie s cieľom nastaviť vlastnosti hydrogélov blízke rôznym typom tkanív.

Výstupy:

1. ZAHORANOVÁ, A. - MRLÍK, M. - TOMANOVÁ, K. - KRONEK, Juraj - LUXENHOFER, R. ABA and BAB triblock copolymers based on 2-methyl-2-oxazoline and 2-n-propyl-2-oxazoline: Synthesis and thermoresponsive behavior in water. In Macromolecular Chemistry and Physics, 2017, vol. 2018, iss.13, art.no. 1700031. (2,500 - IF2016).

2. ŠRÁMKOVÁ, Petra - ZAHORANOVÁ, Anna - KRONEKOVÁ, Zuzana - ŠIŠKOVÁ, Alena - KRONEK, Juraj. Poly(2-oxazoline) hydrogels by photoinduced thiol-ene "click" reaction using diffrent dithiol crosslinkers. In Journal of Polymer Research, 2017, vol. 24, art. no. 82, 13p. (1,615 - IF2016).

11.) Štúdium biokompatibility polymérov a polymérnych materiálov určených pre biomedicínske aplikácie in vitro analýzou cytotoxicity a bunkovej odpovede na molekulovej úrovni signálnych dráh. *(Biocompatibility study of polymers and polymeric materials suitable for biomedical applications. In vitro analysis of cytotoxicity and cell response at the signal transduction level.)*

Zodpovedný riešiteľ:	Zuzana KRONEKOVÁ
Trvanie projektu:	1.01.2015 / 31.12.2017
Evidenčné číslo projektu:	2/0156/15
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	6 199 €

Dosiahnuté výsledky:
V roku 2017 sme sa zamerali na hodnotenie fyzikálno-chemických a biologických vlastností

alginátových mikrosfér a nových typov viackomponentných mikrokapsúl a hydrogélov. Implementácia konfokálnej Ramanovej mikroskopie do štúdia distribúcie polymérnych zložiek v mikrokapsulách a mikrosférach nám pomohla významným spôsobom sledovať a pochopiť javy, ktoré sa dejú počas ich prípravy, skladovania a vystavenia podmienkam in vivo, ktoré boli zhrnuté v odoslanej publikácii do Scientific Reports [1] a prezentované na konferenciách [2,3,4]. Podieľali sme sa aj na vývoji viaczložkového hydrogélu na báze prírodných polysacharidov a ricínového oleja za učelom vyvinúť hydrogély využívané na hojenie rán. In vitro experimenty ukázali biokompatibilitu takýchto hydrogélov a pri použití in vivo sa dosiahlo zrýchlenie hojenia kože v porovnaní s komerčnými materiálmi[5]. Výsledky našej práce boli prezentované aj na ďalšej domácej konferencii[6].

Výstupy:

1. KRONEKOVÁ, Zuzana - PELACH, Michal - MAZANCOVÁ, Petra - UHELSKÁ, Lucia - TREĽOVÁ, Dušana - RÁZGA, Filip - NÉMETHOVÁ, Veronika - *SZALAI, Szabolcs - CHORVÁT, Dušan* - MCGARRIGLE, J. J. - OMAMI, M. - ISA, D. - GHANI, S. - MAJKOVÁ, E. - OBERHOLZER, J. - *RAUS, Vladimír* - ŠIFFALOVIČ, P.- LACÍK, Igor. Structural changes in hydrogel microspheres exposed to in vivo environment as revealed by confocal Raman microscopy,odoslané do Scientific Reports, odpovede recenzentom. 4,259 - IF2016

2. KRONEKOVÁ, Zuzana - PELACH, Michal - MAZANCOVÁ, Petra - UHELSKÁ, Lucia - TREĽOVÁ, Dušana - RÁZGA, Filip - NÉMETHOVÁ, Veronika - *RAUS, Vladimír* - MCGARRIGLE, J. J. - OBERHOLZER, J. - ŠIFFALOVIČ, P. - LACÍK, Igor. Structural changes in hudrogel microspheres triggered by in Vivo conditions as revealed by confocal raman microscopy. In 14th Confocal Raman Imaging Symposium : abstracts. - Ulm, Germany : WiTec focus innovations, 2017, non p. Typ: AFG

3. KRONEKOVÁ, Zuzana - PELACH, Michal - MAZANCOVÁ, Petra - UHELSKÁ, Lucia - TREĽOVÁ, Dušana - RÁZGA, Filip - NÉMETHOVÁ, Veronika - *RAUS, Vladimír* - MCGARRIGLE, J. J. - OBERHOLZER, J. - ŠIFFALOVIČ, P. - LACÍK, Igor. Confocal raman microscopy of hydrogel microspheres. In ChemZi : Slovenský časopis o chémii pre chemické vzdelávanie, výskum a priemysel, 2017, roč. 13, č. 1, s. 108-109. ISSN 1336-7242. Typ: AFH

4. *FRAŇO, Milan* - TREĽOVÁ, Dušana - KRONEKOVÁ, Zuzana - KLEŠČÍKOVÁ, Lucia - MAZANCOVÁ, Petra - NÉMETHOVÁ, Veronika - HEYDARI, Abolfazl - UHELSKÁ, Lucia - *RAUS, Vladimír* - RÁZGA, Filip - MCGARRIGLE, J. - OBERHOLZER, J. - LACÍK, Igor. Multicomponent microcapsule for islets encapsulation in diabetes treatment. In 25th International Conference on Bioencapsulation : abstract book. - La Chapelle sur Erde, France : Bioencapsulation Research Group, 2017, p.150-151. Typ: AFG

5. NADA, A. A. - RAJESH, A. M. - KRONEKOVÁ, Zuzana - MOSNÁČEK, Jaroslav – RUDRAIAH, S. - KUMBAR, S. G. Bioactive Polymeric Formulations for Wound Healing, odoslané do Polymers for Advanced technologies, 1,907-IF2016

6. KRONEKOVÁ, Zuzana. Polymeric materials for biomedical applications. In Workshop of the Slovak Academy of Sciences with The National University of Singapore, The Nanyang Technological University and the Agency for Science, Technology and Research (Singapore), 13-17 March 2017, Smolenice Castle, Slovakia : Book of Abstracts. - Bratislava : SAV, 2017, p. 6. Typ: AFH

12.) Polymérne nanokompozity a hybridy a ich aplikácie ako senzory a aktuátory. *(Polymeric nanocomposites and hybrids and their applications as sensors and actuators.)*

Zodpovedný riešiteľ: Mária OMASTOVÁ

Trvanie projektu:	1.01.2014 / 31.12.2017
Evidenčné číslo projektu:	2/0149/14
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	18 380 € + 1 194 €

Dosiahnuté výsledky:
Uhlíkové nanotrubičky (CNT) sa modifikovali farbičkami Azure A (AA), neutrálna červená (NR) a Kongo červená (CR) tak, že sa najprv diazotovali a následne naviazali na povrch MWCNT vo vode pri 20 °C bez akéhokoľvek redukčného činidla. Pripravené CNT-AA, CNT-NR, a nanokompozity CNT-CR boli dôkladne charakterizované pomocou IČ a Ramanovej spektroskopie, XPS, TGA, TEM a elektrochemickou analýzou. IR, XPS a Raman nám umožnili monitorovať zmenu zloženia povrchu a výsledky dokázali, že farbivá boli na povrch naočkované. Rovnomerné pokrytie CNT dosahuje hrúbku vrstvy 1,5-3 nm pre Azure A a neutrálnu červenú a 6,3 ± 0,7 nm pre Kongo červenú. Cyklická voltametria dokázala, že farbivá sú naozaj kovalentne pripojené k CNT. V skutočnosti to naznačujú aj kvantové chemické výpočty kovalentné naočkovanie s vysokou väzbovou energiou (do 185 kJ/mol pre Kongo červená-diazónium), ale aj podporu energetického ? stohovanie (do 115 kJ/mol pre Kongo červenú). Na príklade CNT-NR sa preukázalo, že tento robustný hybrid je citlivý na pH, čo bolo demonštrované vyšším stupňom protonácie CNT-modifikovanými s neutrálnou červenou pri pH 2 v porovnaní s neutrálnym vodným médiom. Táto práca ukazuje, že diazotované farbivá sa môžu použiť na povrchovú modifikáciu MWCNs veľmi jednoduchým a účinným spôsobom vo vode a pri izbovej teplote. Hybridy by mohli nájsť použitie ako sú opticky pH reagujúce materiály, biosenzory, optotermálne kompozitné aktuátory atď. Práca bola publikovaná v časpise Langmuir.

Výstupy:

1. BENSGHAIER, A. - LAU TRUONG, S. - SEYDOU, M. - LAMOURI, A. - LEROY, E. - MIČUŠÍK, Matej - *CZANIKOVÁ, Klaudia* - BEJI, M. - PINSON, J. - OMASTOVÁ, Mária - CHEHIMI, M. M.* Efficient covalent modification of multiwalled carbon nanotubes with diazotized dyes in water at room temperature. In Langmuir, 2017, vol. 33, p. 6677-6690. (3.833 - IF2016). (2017 - Current Contents). ISSN 0743-7463. Typ: ADCA.

2. HAMOUMA O. - OUKIL D. - OMASTOVÁ, Mária - CHEHIMI, M. M. Flexible paper@carbon nanotube@polypyrrole composites. The combined pivotal roles of diazonium chemistry and sonochemical polymerization. In Colloids and Surfaces A: Physicochemical and Engineering Aspect, 2017, vol. 538, p. 350 -360. Typ: ADCA.

3. OMASTOVÁ, Mária. Carbon nanostructures for sensors & acctuators. In Workshop of the Slovak Academy of Sciences with The National University of Singapore, The Nanyang Technological University and the Agency for Science, Technology and Research (Singapore), 13-17 March 2017, Smolenice Castle, Slovakia : Book of Abstracts. - Bratislava : SAV, 2017, p. 14-15. Typ: AFH

4. *TABAČIAROVÁ, Jana* - MIČUŠÍK, Matej - PIONTECK, J. - OMASTOVÁ, Mária. Composites on the base of elastomer/carbon nanostructures as gas sensors. In EUROFILLERS 2017 : Polymer Blends : abstract book. - Heraklion, Crete : University of Crete, 2017, p. 121. Typ: AFG

13.) Modelovanie a syntéza hybridného konjugovaného systému pre protinádorovú terapiu. *(Modeling and synthesis of hybrid conjugated systems for anticancer therapy.)*

Zodpovedný riešiteľ:	Filip RÁZGA
Trvanie projektu:	1.01.2015 / 31.12.2018
Evidenčné číslo projektu:	2/0094/15
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	6 701 €

Dosiahnuté výsledky:

• Funkčná modifikácia oligonukleotidov pre potreby konjugačných reakcií
• Príprava polymérneho komponentu plánovaného na konjugáciu
• Príprava prekurzorov pre konjugačné reakcie
• Obojstranná konjugácia koncových nukleotidov do hybridného konštruktu
• Uzavretie problematiky Chit/TPP liekových nosičov pre potreby kontrolovaného uvolňovania vyvíjaného hybridného systému
• Syntéza derivátov chitozánu pre prípravu efektívnejších liekových nosičov
• Optimalizácia molekulárne biologických metód pre potreby validácie vyvíjaného hybridného systému a vyvíjaných liekových nosičov

Výstupy:

1. MAZANCOVÁ, Petra - NÉMETHOVÁ, Veronika - LACÍK, Igor - RÁZGA, Filip. Chitosan-based particles: The (forgotten) interplay between process, properties and performance. In Materials Science and Engineering C: Materials for Biological Applications, 2017, vol. 71, p. 570-571. (4,164 - IF2016). ISSN 0928-4931.

2. NÉMETHOVÁ, Veronika - RÁZGA, Filip. Overexpression of ABCB1 as prediction marker for CML: How close we are to translation into clinics? In Leukemia, 2017, vol.31, no.1, p. 266-267. (11,702 - IF2016). ISSN 0887-6924.

3. RÁZGA, Filip - NÉMETHOVÁ, Veronika. Gene expression patterns as predictive biomarkers in hematology-oncology, principal hurdles on the road to the clinic. In Haematologica : the hematology journal, 2017, vol. 102, p. e31-e32. (7,702 - IF2016). ISSN 0390-6078.

4. RÁZGA, Filip - NÉMETHOVÁ, Veronika. Selective therapeutic intervention: A challenge against off-target effects. In Trends in Molecular Medicine, 2017, vol. 23, no. 8, p. 671-674. (10.732 - IF2016). ISSN 1471-4914.

5. RÁZGA, Filip - NÉMETHOVÁ, Veronika. A method for altering the functional state of MRNA allowing its selective and specific recognition : International Publication Number: WO 2017/065696 A2. International Publication Date: 20.4. 2017. International Application Number: PCT/SK2016/060002. International Filing Date: 12.10. 2016. Priority Data: PP 50065-2015 15.10. 2015. Applicant: Ústav polymérov SAV, Dúbravská cesta 9, 845 41 Bratislava. International Bureau : World Intellectual Property Organization, 2017. 16 s.

6. MAZANCOVÁ, Petra - TREĽOVÁ, Dušana - NÉMETHOVÁ, Veronika - KLEŠČÍKOVÁ, Lucia - LACÍK, Igor - RÁZGA, Filip. Chitosan/TPP particles at physiological pH: do they exist at all? In Biomedizinische Technik, 2017, vol. 62, no. S2, p. 64. (0,915 - IF2016). ISSN 0013-5585.

7. KLEŠČÍKOVÁ, Lucia - NÉMETHOVÁ, Veronika - SORAL, M. - RÁZGA, Filip. A versatile approach for nucleobase modification. In 1st Symposium on Nucleic Acid Modifications : 4-6 September 2017 : book of abstracts. - Mainz, Germany : Institute of Molecular Biology, 2017, p. 82.

8. MAZANCOVÁ, Petra - RÁZGA, Filip - NÉMETHOVÁ, Veronika - LACÍK, Igor.

Straightforward but non-trivial concept of chitosan-TTP particles. In Biomedicínske centrum SAV. Genetic toxicology and cancer prevention : book of abstracts. - Bratislava : Cancer research institute, Biomedical research center, 2017, p. 16-17. ISBN 978-80-972247-2-1.(Genetic toxicology and cancer prevention : Bilateral Czech and Slovak meeting).

9. NÉMETHOVÁ, Veronika - RÁZGA, Filip - MAZANCOVÁ, Petra - SVITKOVÁ, B. - BÁBELOVÁ, A. - ŠELC, M. - GÁBELOVÁ, A. Nanoparticle characterization is critical for correct interpretation of biological data. In Biomedicínske centrum SAV. Genetic toxicology and cancer prevention : book of abstracts. - Bratislava : Cancer research institute, Biomedical research center, 2017, p. 18-19. ISBN 978-80-972247-2-1.

10. RÁZGA, Filip - NÉMETHOVÁ, Veronika. Therapy resistance in CML: The complexity that stands behind. In Biomedicínske centrum SAV. Genetic toxicology and cancer prevention : book of abstracts. - Bratislava : Cancer research institute, Biomedical research center, 2017, p. 20. ISBN 978-80-972247-2-1.(Genetic toxicology and cancer prevention : Bilateral Czech and Slovak meeting).

11. MAZANCOVÁ, Petra – NÉMETHOVÁ, Veronika – TREĽOVÁ, Dušana – KLEŠČÍKOVÁ, Lucia – LACÍK, Igor – RÁZGA, Filip. Dissociation of chitosan/tripolyphosphate complexes into separate components upon pH elevation. Odoslané do Carbohydrate Polymers, (4,811-IF2016).

12. NÉMETHOVÁ, Veronika – RÁZGA, Filip. CML on target. Odoslané do Cancer Medicine. (3,362-IF2016).

14.) Elektricky vodivé nanokompozity na báze nanoštruktúrneho grafitu. *(Electrically conductive polymer nanocomposites based on the nanostructured graphite.)*

Zodpovedný riešiteľ:	Zdenko ŠPITÁLSKY
Trvanie projektu:	1.01.2016 / 31.12.2019
Evidenčné číslo projektu:	2/0093/16
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	12 000 € + 2 211 €

Dosiahnuté výsledky:

Pripravila sa séria kompozitných filmov plnených grafénmi pripravených redukciou nevodivého grafén oxidu za rôznych podmienok a porovnával sa vplyv prípravy grafénu na výslednú vodivosť kompozitu. Okrem toho sa pripravila séria kompozitov s expandovaným grafitom, ktoré sa úspešne testovali pre použitie v 3D tlačiarňach.

Výstupy:

1. KOZAKOVIČOVÁ, J. - KOVÁČOVÁ, Mária - MARKOVIĆ, Zoran M. - ŽIGO, Ondrej - CSOMOROVÁ, Katarína - VYSOPAL, M. - ŠPITÁLSKY, Zdenko. New carbon based polymer composites for 3D printing of automotive parts. In PMA 2017 & SRC 2017 : International Conference on Polymeric Materials in Automotive : 23rd Slovak Rubber Conference : book of proceedings. Techn.red. D. Jochec-Mošková. - Bratislava, Slovakia : Slovak University of Technology, Faculty of Chemical and Food Technology & Polymer Institute of SAS, 2017, p. 198-199. ISBN 978-80-89841-04-2.(PMA 2017 & SRC 2017 : International Conference on Polymeric Materials in Automotive : Slovak Rubber Conference). Typ: AFD

2. ŠPITÁLSKY, Zdenko - KOZAKOVIČOVÁ, J. - KOVÁČOVÁ, Mária - PROCHÁZKA, Michal

- ŽIGO, Ondrej - CSOMOROVÁ, Katarína - VYSOPAL, M. Polymérne kompozity pre 3D tlač. In ChemZi : Slovenský časopis o chémii pre chemické vzdelávanie, výskum a priemysel, 2017, roč. 13, č. 1, s. 107-108. ISSN 1336-7242. Typ: AFH

15.) Príprava polymérnych mikrosfér interným gélovaním v emulzii a kritické zhodnotenie ich vlastností smerom k funkčnej liečbe cukrovky typu I. *(Preparation of polymeric microspheres via internal gelation in emulsion and critical evaluation of their properties toward functional treatment of type I diabetes.)*

Zodpovedný riešiteľ:	Dušana TREĽOVÁ
Trvanie projektu:	1.01.2016 / 31.12.2018
Evidenčné číslo projektu:	2/0059/16
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	2 904 €

Dosiahnuté výsledky:
Cieľom riešenia v tomto období bol scale-up celého procesu a príprava väčšieho množstva alginátových mikrosfér za účelom detailného štúdia ich vlastností s využitím rôznych analytických metód. V nasledujúcom období sa plánujeme zamerať na posúdenie vplyvu vlastností alginátových mikrosfér na prežívanie enkapsulovaných buniek.

Výstupy:

1. *FRAŇO, Milan* – TREĽOVÁ, Dušana – KRONEKOVÁ, Zuzana – KLEŠČÍKOVÁ, Lucia – MAZANCOVÁ, Petra – NÉMETHOVÁ, Veronika – HEYDARI, Abolfazl – UHELSKÁ, Lucia – *RAUS, Vladimír* – RÁZGA, Filip - McGARRIGLE, J. - OBERHOLZER, J. - LACÍK, Igor. Multicomponent microcapsule for islets encapsulation in diabetes treatment. 25th International Conference on Bioencapsulation 2017, 3.-6.7.2017, La Chapelle sur Erdre, France, poster P-29, Abstract Book p. 150.

2. TREĽOVÁ, Dušana - RÁZGA, Filip - KRONEKOVÁ, Zuzana - NÉMETHOVÁ, Veronika - UHELSKÁ, Lucia - *RAUS, Vladimír* - MAZANCOVÁ, Petra - *FRAŇO, Milan* - HEYDARI, Abolfazl - KLEŠČÍKOVÁ, Lucia - ROKSTAD, A. M. - MARCHESE, E. - McGARRIGLE, J. - OBERHOLZER, J. - LACÍK, Igor. Polyelectrolyte microcapsules: A bridge to improved diabetes treatment. In DVSPM 2017 : Danube Vltava Sava Polymer Meeting : book of abstracts. - Vienna, Austria : Institute of Applied Synthetic Chemistry TU Wien, 2017, abstract no. IL-21. ISBN 978-3-9504017-6-9.

3. KRONEKOVÁ, Zuzana - PELACH, Michal - MAZANCOVÁ, Petra - UHELSKÁ, Lucia - TREĽOVÁ, Dušana - RÁZGA, Filip - NÉMETHOVÁ, Veronika - *RAUS, Vladimír* - McGARRIGLE, J. J. - OBERHOLZER, J.- ŠIFFALOVIČ, P. - LACÍK, Igor. Structural changes in hydrogel microspheres triggered by in vivo conditions as revealed by confocal raman microscopy. In 14th Confocal Raman Imaging Symposium : abstracts. - Ulm, Germany : WiTec.

4. TREĽOVÁ, Dušana - UHELSKÁ, Lucia - RÁZGA, Filip - NÉMETHOVÁ, Veronika - *RAUS, Vladimír* - MAZANCOVÁ, Petra - KRONEKOVÁ, Zuzana - *FRAŇO, Milan* - KLEŠČÍKOVÁ, Lucia - ROKSTAD, A. M. - MARCHESE, E. - MCGARRIGLE, J. - OBERHOLZER, J. – LACÍK, Igor. Multicomponent polyelectrolyte complex microcapsule for immunoprotection of transplanted pancreatic islets, 46th World Chemistry Congress, 40a Reuni?o Anual da Sociedade Brasileira de Química, and IUPAC 49th General Assembly held from July 7th to 14th, 2017 in Brazil.

5. TREĽOVÁ, Dušana - RÁZGA, Filip - KRONEKOVÁ, Zuzana – PELACH, Michal - NÉMETHOVÁ, Veronika - *RAUS, Vladimír* - MAZANCOVÁ, Petra - UHELSKÁ, Lucia - KLEŠČÍKOVÁ, Lucia – HEYDARI, Abolfazl – SIFFALOVIC, P. – MAJKOVA, E. - ROKSTAD, A. M. - MCGARRIGLE, J. - OBERHOLZER, J. – LACÍK, Igor. Encapsulated pancreatic islets: the next generation diabetes treatment. "Smart Specialization Strategy in the Field of Biotechnologies in Europe: A Challenge for CEE Region", Bratislava, Sept 4 – 6 2017.

6. MAZANCOVÁ, Petra – NÉMETHOVÁ, Veronika – TREĽOVÁ, Dušana – KLEŠČÍKOVÁ, Lucia – LACÍK, Igor – RÁZGA, Filip. Disintegration of chitosan/tripolyphosphate complexes into separate components upon pH elevation. Odoslané do Carbohydrate Polymers, (4,811-IF2016).

Programy: APVV

16.) BIONANOGOLD: Nanočastice zlata: vplyv fyzikálno-chemických vlastností na distribúciu, akumuláciu a toxicitu in vivo. *(Gold nanoparticles: impact of physico-chemical properties on distribution, accumulation and long-term toxicity in vivo.)*

Zodpovedný riešiteľ:	Andrea BÁBELOVÁ
Zodpovedný riešiteľ v organizácii SAV:	Filip RÁZGA
Trvanie projektu:	1.07.2017 / 30.06.2021
Evidenčné číslo projektu:	APVV-16-0579
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Biomedicínske centrum SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	0

Dosiahnuté výsledky:
• Syntéza derivátov chitozánu pre potreby povrchovej úpravy nanočastíc zlata
• Syntéza derivátov chitozánu pre potreby prípravy nanočastíc na báze chitozánu

Výstupy:

1. MAZANCOVÁ, Petra – NÉMETHOVÁ, Veronika – TREĽOVÁ, Dušana – KLEŠČÍKOVÁ, Lucia – LACÍK, Igor – RÁZGA, Filip. Dissociation of chitosan/tripolyphosphate complexes into separate components upon pH elevation. Odoslané do Carbohydrate Polymers, (4,811-IF2016). Podiel: 1,0 (F).

17.) IRENKA: Imobilizované rekombinantné mikroorganizmy pre biotechnologickú produkciu chemických špecialít pomocou biokatalytických kaskádových reakcií. *(Immobilized recombinant microorganisms for the biotechnological production of chemical specialties using biocatalytic cascade reactions.)*

Zodpovedný riešiteľ:	Marek BUČKO
Zodpovedný riešiteľ v organizácii SAV:	Igor LACÍK
Trvanie projektu:	1.07.2016 / 30.06.2020
Evidenčné číslo projektu:	APVV- 15 – 0227
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Chemický ústav SAV

Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 9060 €

Dosiahnuté výsledky:
Charakterizovali sa hydrogélové imobilizačné systémy pre imobilizáciu katalyzátorov fyzikálno-chemickými metódami. Získali sa poznatky ohľadne využitia syntetizovaného sulfátu celulózy s nízkym stupňom substitúcie pre tvorbu mikrokapsúl využitých na daný účel imobilizácie biokatalyzátorov.

Výstupy:

1. KRAJČOVIČ, T. - BUČKO, M. - VIKARTOVSKÁ, A. - LACÍK, Igor - UHELSKÁ, Lucia - *CHORVÁT, Dušan* - NEDĚLA, V. - TIHLAŘÍKOVÁ, E. - GERICKE, M. - HEINZE, T. - GEMEINER, P. Polyelectrolyte complex beads by two-step process for improved performance of viable whole-cell Baeyer-Villiger monoxygenase by immobilization. In Catalysts 2017, vol. 7 (353), p.1-12 (3,082 - IF2016). ISSN 2073-4344. Podiel: 0,18 (F)

18.) CONFMAC: Štrukturálne prechody (bio)makromolekúl v nanokanáloch. *(Structural transitions of (bio)macromolecules in nanochannels.)*

Zodpovedný riešiteľ:	Peter CIFRA
Trvanie projektu:	1.07.2016 / 30.06.2020
Evidenčné číslo projektu:	APVV-15-0323
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 28 196 €

Dosiahnuté výsledky:
Molekulovými simuláciami sme vyšetrili konformačné správanie polotuhých makromolekúl v poli cylindrických nanopostov pri zmenách geometrie nanopostov, tuhosti makromolekúl a ich topológie. V porovnaní s predošlými štúdiami obmedzovaných makromolekúl v jednotlivých kanáloch tu dochádza ku súčasnému obmedzovaniu a prerozdeľovaniu reťazca medzi viacero intersticiálnych kvázi-cylindrických objemov medzi nanopostami. Ku podstatným zisteniam patrí, že menej ohybné reťazce penetrujú medzi nanopostami ľahšie a zaberajú viacero intersticiálnych objemov. Pole nanopostov je možné reprezentovať semi-kvantitatívne ako kombináciu intersticiálneho objemu s geometriou cylindrického kanálu a priechodu medzi týmito priestormi v tvare úzkej štrbiny. Ak penalta voľnej energie v týchto dvoch obmedzeniach je rovnaká dochádza ku nástupu penetrácie pomedzi nanopostami. Takto je možné vysvetliť správanie makromolekúl v takomto obmedzení a podarilo sa vysvetlit aj zaujímavé pozorovanie kde vystieranie reťazcov v smere pozdĺž nanopostov pri zahusťovaní nanopostami s konštantnou šírkou štrbiny medzi postami je nemonotónne. Tento prechod v správaní je dôsledkom súťaže medzi vystieraním v intersticiálnom objeme a penetráciou medzi postami. Aj tento prechod je citlivý na zmeny v tuhosti reťazca. Okrem vplyvu tuhosti sme vyšetrili aj vplyv topológie reťazcov, okrem lineárnych sme sledovali aj cyklické polyméry. Tieto zistenia môžu nájsť aplikácie pri riadení makromolekulových konformácií v súčasných nanotechnologických technikách ako je analýza jednotlivých makromolekúl DNA v nanofluidných zariadeniach.

Výstupy:

1. BENKOVÁ, Zuzana - RIŠPANOVÁ, Lucia - CIFRA, Peter. Structural behavior of a semiflexible polymer chain in an array of nanoposts. In Polymers : Open Access Polymer Science Journal, 2017,

vol. 9, art. no. 313. (3.364 - IF2016). ISSN 2073-4360. Dostupné na internete: <www.mdpi.com/journals/polymers>.

2. BENKOVÁ, Zuzana - RIŠPANOVÁ, Lucia - CIFRA, Peter. Effect of chain stiffness for semiflexible macromolecules in array of cylindrical nanoposts. In Journal of Chemical Physics, 2017, vol.147, art.no. 134907. (2.965 - IF2016). (2017 - Current Contents, WOS, SCOPUS). ISSN 0021-9606.

19.) MOPODEG: Modifikované polyméry z obnoviteľných zdrojov a ich degradácia. *(Modified polymers from renewable resources and their degradation.)*

Zodpovedný riešiteľ:	Štefan CHMELA
Trvanie projektu:	1.07.2016 / 30.06.2020
Evidenčné číslo projektu:	APVV-15-0528
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 44 000 € pre ÚPo (celkove 64 000 €)

Dosiahnuté výsledky:

Podrobne sa študoval proces starnutia fólií čistej zmesi biopolymérov polylaktidu/polyhydroxy butyrátu ako aj zmesi plnenej 1 váh. % sadzí. Lisované fólie sa testovali pri ich využití ako mulčovacie fólie v poľnohospodárstve. Sledovala sa osobitne degradácia fólií na slnku, ako aj fólie v pôde. Degradácia bola sledovaná pomocou gélovej permeačnej chromatografie, DSC a mechanické vlastnosti pomocou DMTA a na Instrone. Prídavok sadzí do PLA/PHB zmesí sa prejavil zvýšenou odolnosťou voči foto- a termodegradácii. Prítomnosť sadzí zabránila dodatočnej kryštalizácii zmesi PLA/PHB v priebehu prírodného starnutia, čo sa prejavilo dlhším zachovaním mechanických vlastností.

Pokračovalo sa v štúdiách polymerizácie laktidu v roztoku ako aj v komore Plastografu Brabenber. Pri roztokových polymerizáciách sa testovali anorganický cínatý (2-etylhexanoát cínatý) iniciátor ako aj titaničité iniciátory (tetrabutyl a tetrapropyl ortotitanát). Boli testované aj organické iniciátory TBD (1,5,7-triazabicyklo[4.4.0]dec-5-én) a DBU (1,8-diazabicyklo [5.4.0] undec-7-én), ktoré pri roztokovej polymerizácii vykázali výnimočnú aktivitu. Polymerizácia laktidu v roztoku v prítomnosti TBD dosiahla konverziu 98 % za 1 minútu pri laboratórnej teplote. Kedže polymerizácia v Brabendri vyžaduje teplotu 180 oC na roztavenie a účinné miešanie laktidu, použitie organických iniciátorov je vylúčené. Tu sa používali cínaté a titaničité katalyzátory. Oba typy vykázali dostatočnú rýchlosť iniciácie a dosiahli sa konverzie nad 95 % po 15 minútach miešania. Polymerizácie v prítomnosti 5% derivátov keratínu viedli k úplnej deštrukcii zmesi a ku tvorbe čierneho tekutého produktu. Pravdepodobne zbytky vody a kyslého katalyzátora HCl použitého pri hydrolýze keratínu sú príčinou týchto zlyhaní. Nové deriváty keratínu a kolagénu pripravené bázickou hydrolýzou pri TGA meraní vykázali samotné dostatočnú termickú stabilitu a nezmenili farbu ani po 40 minútach pri 180 oC. Budú testované v najbližšom období. Testoval sa aj vplyv kloizitov na polymerizáciu laktidu za účelom ich kovalentného viazania na polylaktid cez voľné –OH skupiny. NMR merania výsledných zmesí poskytli spektrá so širokými pásmi, v ktorých pás odpovedajúci metínovej CH väzbe monoméru sa prekrýval so signálom z polyméru a určenie konverzie je týmto spôsobom nepresné. Konverzie sa určili z GPC meraní v THF a trifluóretanole. Dosiahli sa nízke konverzie ca. 15-30% po čase miešania 15 min.v porovnaní s procesom polymerizácie čistého polylaktidu - 98 %.

Výstupy:

1. MOSNÁČKOVÁ, Katarína - DANKO, Martin - ŠIŠKOVÁ, Alena - FALCO, L. M. - JANIGOVÁ, Ivica - CHMELA, Štefan - VANOVČANOVÁ, Z. - OMANÍKOVÁ, L. - CHODÁK, Ivan - MOSNÁČEK, Jaroslav. Complex study of the physical properties of a poly(lactic acid)/poly(3-hydroxybutyrate) blend and its carbon black composite during various outdoor and laboratory ageing conditions. In RSC Advances, 2017, vol. 7, p. 47132-47142. (3.108 - IF2016). DOI: 10.1039/c7ra08869h, ISSN 2046-2069.

2. ŠIŠKOVÁ, Alena - CSOMOROVÁ, Katarína - KLEINOVÁ, Angela - OPÁLEK, A. - ECKSTEIN ANDICSOVÁ, Anita. Controlled releases system for agrochemicals on the base of functionalized cellulose. In Frontiers in Polymer Science: fifth international symposium: in assotiation with the journal polymer: abstracts. - Seville, Spain: Elsevier, 2017, non p., [P3.126].

3. ŠIŠKOVÁ, Alena - RYDZ, J. - MOSNÁČKOVÁ, Katarína - ECKSTEIN ANDICSOVÁ, Anita - SIKORSKA, W. Advanced characterization of bio-polymers and their degradation products. In Italian-Nordic Polymer Future: booklet of abstract & list of participants [elektronický zdroj]. - Pisa, Italy: Univerista di Pisa, 2017, p. 52.

4. ŠIŠKOVÁ, Alena - KOZMA, E. - GALEOTTI, M. - OPÁLEK, A. - RYDZ, J. - ECKSTEIN ANDICSOVÁ, Anita. Natural polymers for innovative applications. In Brochure of the International Workshop on Polymer Science and Polymeric Materials. - Bratislava, Budapest, Zabrze : Centre of Polymer and Carbon Materials Polish Academy of Sciences, Research Centre for Natural Sciences Hungarian Academy of Sciences, Polymer Institute of the Slovak Academy of Sciences, 2017, p. 16. ISBN 978-80-89841-06-6.

5. ŠIŠKOVÁ, Alena - ECKSTEIN ANDICSOVÁ, Anita. Chemical functionalization of cellulose materials. In Applied natural sciences 2017: conference proceedings of the 6th Biennial international scientific conference. - Trnava: University of SS. Cyril and Methodius in Trnava, 2017, p. 50. ISBN 978-80-8105-547-8. (Applied natural sciences 2017: Biennial international scientific conference).

6. MOSNÁČKOVÁ, Katarína - DWORAK, C. L. - KLEINOVÁ, Angela - ŠIŠKOVÁ, Alena - SASINKOVÁ, V. - MIČUŠÍK, Matej - *KASÁK, Peter* - MOSNÁČEK, Jaroslav. Partially biodegradable polymer hybrids based on MWNTs. In Brochure of the International Workshop on Polymer Science and Polymeric Materials. - Bratislava, Budapest, Zabrze, 2017, p. 19. ISBN 978-80-89841-06-6.

20.) METALLOCENE: Nereaktívne tavné lepidlá na báze metalocénových polymérov pre priemyselné aplikácie. *(Unreactive melt adhesives based on metallocene polymers for industrial applications.)*

Zodpovedný riešiteľ:	Ivan CHODÁK
Trvanie projektu:	1.07.2015 / 30.06.2019
Evidenčné číslo projektu:	APVV-14-0566
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 26 590 € pre ÚPo (celkove 64 677 €)

Dosiahnuté výsledky:

Najväčšia kapacita sa venovala optimalizácii základných metalocénových polymérov polárnymi funkčnými skupinami, a to z hľadiska ako koncentrácie funkčných skupín, tak aj postupov prípravy vzhľadom na pozorovaný pokles mólových hmotností nosného polyméru, ktorý sprevádzalo aj

hnednutie materiálu nasvedčujúce oxidácii.
Postup modifikácie sa upravil zakúpením komerčného ozonizátora, ktorý umožňuje regulovanie nielen času, ale aj koncentrácie ozónu. Súčasne umožňuje prípravu väčšieho množstva modifikovaného polyolefínu, potrebného na charakterizáciu vlastností pripravených tavných lepidiel v plnom rozsahu testov.

Výstupy:

1. PAVLINEC, Jiří - CHODÁK, Ivan - NOVÁK, Igor - VANKO, V. - PREŤO, J. Influence of polar groups grafting to metallocene polyolefins on hot melt adhesive properties in packaging industry. In ChemZi : Slovenský časopis o chémii pre chemické vzdelávanie, výskum a priemysel, 2017, roč. 13, č. 1, s. 196-197. ISSN 1336-7242

21.) NANOSEN: Nanočasticové sensory pre plynné biomarkery chorôb. *(Nanoparticles-based sensors of gaseous biomarkers of diseases.)*

Zodpovedný riešiteľ:	Ján IVANČO
Zodpovedný riešiteľ v organizácii SAV:	Jaroslav MOSNÁČEK
Trvanie projektu:	1.07.2015 / 30.06.2019
Evidenčné číslo projektu:	APVV-14-0891
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Fyzikálny ústav SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 21490 €

Dosiahnuté výsledky:
Pokračovalo sa vo výskume nanočasticových biosenzorov plynov na báze chemirezistorov, tvorených monovrstvou oxidu kovu. Pozornosť sa okrem oxidov železa upriamila predovšetkým na volfrámové nanočastice. Modifikácia nanočastíc spočívala vo výmene ligandu komerčne dostupných WO3, resp. príprave volfrámových nanočastíc z prekurzora Na2WO4. Nanočastice boli stabilizované polymérnym surfaktantom na báze polybutylakrylátu a polystyrénu, pripravené technikou kontrolovanej polymerizácie ATRP. Ich rozličná dĺžka a charakter by mala definovať konečnú medzičasticovú vzdialenosť pri depozícii polovodičovej vrstvy. Začali sa prvé pokusy na sledovanie senzorickej odozvy na acetón, ktoré ukázali možnosti použitia modifikovaných volfrámových nanočastíc pre tento typ aplikácií.

Výstupy:

1. CVEK, M. - MRLÍK, M. - ILČÍKOVÁ, Markéta - MOSNÁČEK, Jaroslav - MUNSTER, L. - PAVLÍNEK, Vl. Synthesis of silicone elastomers containing silyl-based polymer-grafted carbonyl iron particles: An efficient way to improve magnetorheological, damping, and sensing performances. In Macromolecules, 2017, vol. 50, no. 5, p. 2189-2200. (5.835 - IF2016). ISSN 0024-9297.

22.) BIOGLYKO: Biočipy a biosenzory pre glykorozpoznávanie, ich vývoj, príprava a využitie pri výskume rakoviny. *(Biochips and biosenzors for glycorecognition, their development, preparation and application in cancer research.)*

Zodpovedný riešiteľ:	Jaroslav KATRLÍK
Zodpovedný riešiteľ v organizácii SAV:	Jaroslav MOSNÁČEK

Trvanie projektu:	1.07.2015 / 30.06.2019
Evidenčné číslo projektu:	APVV-143-0753
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Chemický ústav SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	AVVV: 5975 €

Dosiahnuté výsledky:
Sulfobetaínové a karboxybetaínové zwiteriónové kopolyméry obsahujúce pendantnú fotocitlivú skupinu na báze metakrylamidu boli syntetizované a použité na modifikáciu polyetylénových, polyesterových a polystyrénových povrchov. Upravené povrchy získané kovalentným zosieťovaním zwiteriónových kopolymérov s povrchmi polymérov pomocou UV žiarenia pri 365 nm vykazovali zanedbateľnú adhéziu buniek fibroblastov BHK21. Taktiež vlákenné štruktúry boli pripravené zo syntetizovaných kopolymérov pomocou elektrostatického zvlákňovania a následným UV žiarením. Takto pripravený materiál dramaticky znižuje adhéziu buniek fibroblastov BHK21 a jeho potenciálna aplikácia pri modifikácii membrán by zabránila neželanému biologickému znečisteniu. Na základe týchto výsledkov sa pripravili ďalšie karboxybetaínove zwiteriónové ko-polyméry na báze metakrylamidu obsahujúce 5% fotocitlivej skupiny. Výsledné ko-polyméry boli poskytnuté na prípravu biosenzorov a na ich štúdium.

Výstupy:

1. *SOBOLČIAK, Patrik - POPELKA, Anton* - MIČUŠÍK, Matej - SLÁVIKOVÁ, M. - *KRUPA, Igor* - MOSNÁČEK, Jaroslav - TKÁČ, J. - LACÍK, Igor - *KASÁK, Peter*. Photoimmobilization of zwitterionic polymers on surfaces to reduce cell adhesion. In Journal of Colloid and Interface Science, 2017, vol. 500, p. 294-303. (4.233 - IF2016). ISSN 0021-9797.

23.) Nanomat: Nanokompozitné materiály na báze organo-fosfóniových smektitov a polymérov. *(Nanocomposite materials based on organo-phosphonium smectites and polymers.)*

Zodpovedný riešiteľ:	Peter KOMADEL
Zodpovedný riešiteľ v organizácii SAV:	Ivan CHODÁK
Trvanie projektu:	1.07.2016 / 30.06.2020
Evidenčné číslo projektu:	APVV-15-0741
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Ústav anorganickej chémie SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 25600 €

Dosiahnuté výsledky:
Práce pokračovali dvomi smermi. Jedným bola syntéza nových modifikátorov, v molekule ktorých namiesto dusíka vystupuje fosfor. Na prekurzory týchto modifikátorov sa naviazali rozličné ligandy, ktoré by mali zabezpečiť jednak optimálnu interkaláciu do medzivrstvového priestoru a uľahčiť tak exfoliáciu vrstiev počas miešania častíc do vybraných matríc a jednak zvýšiť termodynamickú znášanlivosť povrchu nanoplniva s konkrétnou polymérovou matricou a zabezpečiť dobré mechanické vlastnosti a dlhodobú stabilitu všetkých fyzikálnych parametrov počas skladovania a aplikácie materiálov.
Druhým námetom v počiatku projektu bolo testovanie dostupných organomodifikovaných

montmorilonitov s vybranými matricami. Tieto výsledky budú slúžiť na porovnanie efektivity nových fosfóniových modifikátorov so známymi modifikátormi na báze kvartérnych amóniových solí.

Výstupy:

1. SEDNIČKOVÁ, Michaela - JOCHEC MOŠKOVÁ, Daniela - JANIGOVÁ, Ivica - KRONEK, Juraj - JANKOVIČ, L. - ŠLOUF, M. - CHODÁK, Ivan. Properties of natural rubber composites with structurally different clay intercable surfactants. In Journal of Polymer Research, 2017, vol. 24, art. no. 105. (1.615 - IF2016). ISSN 1022-9760.

2. SEDNIČKOVÁ, Michaela - JOCHEC MOŠKOVÁ, Daniela - JANIGOVÁ, Ivica - KRONEK, Juraj - JANKOVIČ, Ľ. - ŠLOUF, M. - CHODÁK, Ivan. Poly(epsilon-caprolactone)-clay nanocomposites. In ChemZi : Slovenský časopis o chémii pre chemické vzdelávanie, výskum a priemysel, 2017, roč. 13, č. 1, s. 111-112. ISSN 1336-7242.

24.) DARLINK: Vysokoselektívna liečba nádorových ochorení: komplexy endogénnych lipoproteínov s DARPinmi ako nová generácia transportných systémov pre cielený transport liečiv. *(Towards highly seletive cancer treatment: Endogenous lipoprotein-DARPin complexes as a new generation of targeted drug delivery vehicles.)*

Zodpovedný riešiteľ:	Juraj Kronek
Trvanie projektu:	1.7.2016 / 30.6.2020
Evidenčné číslo projektu:	APVV-15-0485
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Prírodovedecká fakulta Univerzity Pavla Jozefa Šafárika, Košice
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 16091 €

Dosiahnuté výsledky:

V uplynulom období sa použili polyetylénglykolové linkre obsahujúce maleimidovú a N-hydroxysukcínimidovú väzbu na prípravu liekového transportného systému obsahujúceho lipoproteínovú jednotku a afinitný proteín v in vivo testoch. Pokračovalo sa v príprave flexibilného linkra na báze poly(2-metyl-2-oxazolínu), kde bol vyvinutý nový typ funkčného iniciátora obsahujúceho maleimidovú skupinu, Taktiež sa pripravili nanočastice na báze poly(2-oxazolínov) pre transport modelového protirakovinového liečiva.

Výstupy:

1. ŠRÁMKOVÁ, Petra – ZAHORANOVÁ, Anna – KRONEKOVÁ, Zuzana – ŠIŠKOVÁ, Alena – KRONEK, Juraj. Poly(2-oxazoline) hydrogels by photoinduced thiol-ene “Click” reaction using different dithiol crosslinkers. Journal of Polymer Research, 2017, vol. 24, art. no. 82, 13p. (1,615 - IF2016).

25.) MEREDIT: Materiály a procesy pre funkčnú enkapsuláciu pankreatických ostrovčekov v liečbe diabetu. *(MEDERIT: Materials and processes for functional encapsulation of pancreatic islets in diabetes treatment.)*

Zodpovedný riešiteľ:	Igor LACÍK
Trvanie projektu:	1.07.2015 / 30.06.2019
Evidenčné číslo projektu:	APVV-14-0858

Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií: 1 - Slovensko: 1
Čerpané financie: APVV: 43 010 € pre ÚPo (celkove 54 422 €)

Dosiahnuté výsledky:
Sfinalizovali sa poznatky ohľadne zavedenia konfokálnej Ramanovej mikroskopie pre analýzu priestorovej distribúcie polymérov tvporiacich alginátové mikrosféry a multikomponentné mikrokapsuly. Vytvorila sa knižnica syntetizovaných polymérov sodná soľ sulfátu celulózy (SCS) a poly(metylén-co-kyanoguanidín) (PMCG), ktoré sú základom tvorby polyelektrolytových mikrokapsúl študovaných našim pracoviskom s cieľom ukázať ich vhodnosť v predklinickom zvieracom modeli. Prvé testy v imunokompetentných myšiach ukazujú na dobrú biokompatibilitu mikrojkapsúl pri použití novo-syntetizovaných SCS polymérov. Bol publikovaný článok, ktorý ukazuje na koagulačnú aktivitu týchto mikrokapsúl.

Výstupy:

1. GRAVASTRAND, C. - HAMAD, S. - FURE, H. - STEINKJER, B. - RYAN, L. - OBERHOLZER, J. - LAMBRIS, J. D. - LACÍK, Igor - MOLLNES, T. E. - ESPEVIK, T. - BREKKE, O.-L. - ROKSTAD, A. M.. Alginate microbeads are coagulation compatible, while alginate microcapsules activate coagulation secondary to complement or directly through FXII. In Acta biomaterialia, 2017, vol. 58, p. 158-167. (6,319 - IF2016). ISSN 1742-7061.

2. KRAJČOVIČ, T. - BUČKO, M. - VIKARTOVSKÁ, A. - LACÍK, Igor - UHELSKÁ, Lucia - *CHORVÁT, Dušan* - NEDĚLA, V. - TIHLAŘÍKOVÁ, E. - GERICKE, M. - HEINZE, T. - GEMEINER, P. Polyelectrolyte complex beads by two-step process for improved performance of viable whole-cell Baeyer-Villiger monoxygenase by immobilization. In Catalysts 2017, vol. 7 (353), p.1-12 (3,082 - IF2016). ISSN 2073-4344.

3. KRONEKOVÁ, Zuzana - PELACH, Michal - MAZANCOVÁ, Petra - UHELSKÁ, Lucia - TREĽOVÁ, Dušana - RÁZGA, Filip - NÉMETHOVÁ, Veronika - *SZALAI, Szabolcs, CHORVÁT, Dušan* - McGARRIGLE, J. J. - OMAMI, M., - ISA, D. - GHANI, S. - MAJKOVÁ, E. - OBERHOLZER, J. - *RAUS, Vladimír* - ŠIFFALOVIČ, P. - LACÍK, Igor. Structural changes in hydrogel microspheres exposed to in vivo environment as revealed by confocal Raman microscopy. V revízii v Scientific Reports. (4,259 - IF2016).

4. TREĽOVÁ, Dušana - RÁZGA, Filip - KRONEKOVÁ, Zuzana - NÉMETHOVÁ, Veronika - UHELSKÁ, Lucia - *RAUS, Vladimír* - MAZANCOVÁ, Petra - *FRAŇO, Milan* - HEYDARI, Abolfazl - KLEŠČÍKOVÁ, Lucia - ROKSTAD, A. M. - MARCHESE, E. - MCGARRIGLE, J. - OBERHOLZER, J. - LACÍK, Igor. Polyelectrolyte microcapsules: A bridge to improved diabetes treatment. In DVSPM 2017 : Danube Vltava Sava Polymer Meeting : book of abstracts. - Vienna, Austria : Institute of Applied Synthetic Chemistry TU Wien, 2017, abstract no. IL-21. ISBN 978-3-9504017-6-9.

5. KRONEKOVÁ, Zuzana - PELACH, Michal - MAZANCOVÁ, Petra - UHELSKÁ, Lucia - TREĽOVÁ, Dušana - RÁZGA, Filip - NÉMETHOVÁ, Veronika - *RAUS, Vladimír* - McGARRIGLE, J. J. - OBERHOLZER, J. - ŠIFFALOVIČ, P. - LACÍK, Igor. Structural changes in hudrogel microspheres triggered by in vivo conditions as revealed by confocal raman microscopy. In 14th Confocal Raman Imaging Symposium : abstracts. - Ulm, Germany : WiTec.

26.) VIS-CuM: Fotochemicky indukovaná meďou sprostredkovaná radikálová polymerizácia s prenosom atómu. *(Photochemically induced copper-mediated atom transfer radical polymerization.)*

Zodpovedný riešiteľ:	Jaroslav MOSNÁČEK
Trvanie projektu:	1.07.2016 / 30.06.2020
Evidenčné číslo projektu:	APVV-15-0545
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 54 675 € pre ÚPo (celkove 60 150 €)

Dosiahnuté výsledky:
Optimalizovali sa podmienky fotoATRP v prítomnosti limitovaného množstva vzduchu pre metyl akrylát a alfa-metylén-gamma-butyrolaktón v DMSO a DMF ako rozpúšťadlách. Uskutočnili sa i hlbšie štúdia mechanizmu, ktorým dochádza k spotrebe kyslíka pred tým ako sa iniciuje samotná polymerizácia. Preštudoval sa vplyv prídavku rôznych terciárnych amínov na veľkosť indukčnej periódy a kinetiku polymerizácie. Predpokladá sa, že dochádza k jednoelektrónovému prenosu z komplexu katalyzátora medi v excitovanom stave na ligand (terciárny amín), pričom jednak vzniknutý katión radikál amínu reaguje s kyslíkom a dochádza k rozkladu amínu na aldehyd. Takýto produkt bol potvrdený NMR spektroskopiou pri použití TPMA ako ligandu.

Výstupy:

1. OSIČKA, J. - ILČÍKOVÁ, Markéta - MRLIK, M. - MINAŘÍK, A. - PAVLINEK, V. - MOSNÁČEK, Jaroslav. The impact of polymer grafting from a graphene oxide surface on its compatibility with a PDMS matrix and the light-induced actuation of the composites. In Polymers : Open Access Polymer Science Journal, 2017, vol. 9, no. 7, art.no. 264. (3.364 - IF2016). ISSN 2073-4360.

2. BORSKÁ, Katarína - MORAVČÍKOVÁ, Daniela - MOSNÁČEK, Jaroslav. Photochemically induced ATRP of (meth)acrylates in the presence of air: The effect of light intensity, ligand, and oxygen concentration. In Macromolecular Rapid Communications, 2017, vol. 38, iss. 13, art.no. 1600639. (4.265 - IF2016). ISSN 1022-1336.

3. BONDAREV, Dmitrij - ZEDNÍK, J. Influence of covalent structure and molecular weight distribution on the optical properties of alternating copolymers and oligomers and oligomers with 1,2,3-triazole and 1,3,4-oxadiazole side groups. In Polymer : the International Journal for the Science and Technology of Polymers, 2017, vol. 124, p. 107-116. (3.684 - IF2016). (2017 - Current Contents). ISSN 0032-3861.

4. BONDAREV, Dmitrij - SIVKOVA, R. - ŠULY, P. - POLÁŠKOVÁ, M. - KREJČÍ, O. - KŘIKAVOVÁ, R. - TRÁVNÍČEK, Z. - ZUKAL, A. - KUBU, M. - SEDLÁČEK, J. Microporous conjugated polymers via homopolymerization of 2,5-diethynylthiophene. In European Polymer Journal, 2017, vol. 92, p. 213-219. (3.531 - IF2016). ISSN 0014-3057

27.) GONanoplatform: Grafénová nanoplatforma na detekciu rakoviny. *(Graphene-based nanoplatform for detection of cancer.)*

Zodpovedný riešiteľ:	Mária OMASTOVÁ
Trvanie projektu:	1.07.2015 / 30.06.2019
Evidenčné číslo projektu:	APVV-14-0120
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0

Čerpané financie: APVV: 22 448 € pre ÚPo (celkove 63 675 €)

Dosiahnuté výsledky:
V rámci spolupráce na projekte spolupracovníci z Ústavu experimentálnej fyziky v Košiciach pripravili a dodali na modifikáciu na naše pracovisko dva typy nanočastíc, magnetické nanočastice modifikované protilátkou (MNps-MAb). Uskutočnili sme modifikáciu GO týmito nanočasticami s využitím optimalizovanej reakcie prebiehajúcej v S pufri, s prítomnosťou surfaktantu v ultrazvukovej vaničke. Modifikovaný GO konjugovanými nanočastice s MAb sa na Virologickom ústave testoval z hľadiska úspešnosti naviazania a aktivitu protilátky voči antigénu.
V ďalšej etape sa pripravovali grafén oxidové (GO) nanočastice Požadovaná veľkosť GO je okolo 100 - 150 nm (10x menšia ako rozmer bunky), čo je dosť malé na to, aby GO prešiel cez cievu. Separácia nanočastíc tohto rozmeru bola v spolupráci s Fyzikálnym ústavom SAV dosiahnutá opakovanou (ultra)centrifugáciou suspenzií GO/rGO. Hrúbka a distribúcia nanočastíc sa skúmala pomocou rôznych technik, vrátane AFM, SEM, TEM, dynamickým rozptylom svetla (DLS), diferenciálnou centrifugačnou sedimentáciou (DCS) a malouhlovým rtg rozptylom pri šikmom dopade (GISAXS) na ÚPo SAV a FÚ SAV.

Výstupy:

1. BODÍK, M. - ZAHORANOVÁ, A. - MIČUŠÍK, Matej - BUGÁROVÁ, Nikola - ŠPITÁLSKY, Zdenko - OMASTOVÁ, Mária - MAJKOVÁ, E. - JERGEL, M. - ŠIFFALOVIČ, P. Fast low-temperature plasma reduction of monolayer graphene oxide at atmospheric pressure. In Nanotechnology, 2017, vol. 28, art.no. 145601. (3.440 - IF2016). ISSN 0957-4484. Typ: ADCA

2. BUGÁROVÁ, Nikola - BODÍK, M. - SOHOVÁ, M. - ŠIFFALOVIČ, P. - ŠPITÁLSKY, Zdenko - OMASTOVÁ, Mária. Graphene oxide-based cancer biosensor. In Bypos : 7th Bratislava Young Polymer Scientists Wokshop : workshop book. - Bratislava : Young Scientist Council of Polymer Institute SAS, 2017, p. ISBN 978-80-89841-05-9. Typ: AFH

3. BUGÁROVÁ, Nikola - BODÍK, M. - ŠIFFALOVIČ, P. - MIČUŠÍK, Matej - ŠPITÁLSKY, Zdenko - ZÁVIŠOVÁ, V. - KONERACKÁ, M. - ZAŤOVIČOVÁ, M. - PASTOREKOVÁ, S. - OMASTOVÁ, Mária. Grafén oxidový biosenzor na detekciu onkologických ochorení. In ChemZi : Slovenský časopis o chémii pre chemické vzdelávanie, výskum a priemysel, 2017, roč. 13, č. 1, s. 88-89. ISSN 1336-7242. Typ: AFH

4. BUGÁROVÁ, Nikola - BODÍK, M. - ŠIFFALOVIČ, P. - PROCHÁZKA, Michal - MIČUŠÍK, Matej - ŠPITÁLSKY, Zdenko - ZÁVIŠOVÁ, V. - KONERACKÁ, M. - ZAŤOVIČOVÁ, M. - PASTOREKOVÁ, S. - OMASTOVÁ, Mária. Modifikácia GO-nanoplatformy. In Workshop 2D nanoplatform for Biosensing: book of abstracts. - Bratislava : Slovenská chemická spoločnosť, Ústav polymérov SAV, 2017, p. 7. Dostupné na internete: pdf>. Typ: AFH

5. BUGÁROVÁ, Nikola - PROCHÁZKA, Michal - BODÍK, M. - MIČUŠÍK, Matej - ŠIFFALOVIČ, P. - OMASTOVÁ, Mária. Inorganic-organic hybrid nanoplastforms for cancer diagnosis. In chem2Dmat : Strasbourg 22-26 August 2017: information and conference booklet. - Strasbourg, France : Université de Strasbourg, 2017, p67. Typ: AFG

28.) NANOSIMKA: Účinok nanoenkapsulovaného simvastatínu na kardiovaskulárny systém pri experimentálnom metabolickom syndróme. *(Effects of nanoencapsulated simvastatin on cardiovascular system in experimental metabolic syndrome.)*

Zodpovedný riešiteľ:	Oľga PECHÁŇOVÁ
Zodpovedný riešiteľ v organizácii SAV:	Jaroslav MOSNÁČEK
Trvanie projektu:	1.07.2015 / 30.06.2019
Evidenčné číslo projektu:	APVV-14-0932

Organizácia je koordinátorom projektu:	nie
Koordinátor:	Ústav normálnej a patologickej fyziológie SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 10410 €

Dosiahnuté výsledky:
Projekt je zameraný na prípravu nanomateriálov s cieleným transportom liečiv, pri ktorom nanočastice dopravia liečivo priamo do postihnutej oblasti bez zaťažovania ostatných častí organizmu. V projekte sa zameralo na simvastatín, liek znižujúci hladinu LDL cholesterolu. Polymérne nanočastice s vhodnými veľkosťami boli vytvorené z troch základných komponentov – N-dodecylmetakrylamid (DMAm), vinylpyrolidón (VP) a poly(etylén glycol) metakrylát PEG360. Reprodukovateľné a stabilné nanočastice s veľkosťou cca. 300 nm sa dosiahli mólovým pomerom jednotlivých monomérov 11:1:14 (DMAm:VP:PEG). Po naplnení častíc simvastatínom sme pozorovali jeho uvoľňovanie do zmesi voda:acetonitril (1:2) pomocou vysoko účinnej kvapalinovej chromatografie (HPLC). Predmetom ďalšieho štúdia bude rýchlosť a miesto uvoľňovania simvastatínu in vivo.

Výstupy:

1. DANKO, Martin - MOSNÁČEK, Jaroslav. Ring-opening polymerization of gamma-butyrolactone and its derivatives: A review. In POLIMERY-W, 2017, vol. 62, no. 4, p. 272-282. (0.778 - IF2016). ISSN 0032-2725.

2. PEPTU, Cristian - BALAN-PORCARASU, M. - ŠIŠKOVÁ, Alena - ŠKULTÉTY, Ľ. - MOSNÁČEK, Jaroslav. Cyclodextrins tethered with oligolactides - green synthesis and structural assessment. In Beilstein Journal of Organic Chemistry, 2017, vol. 13, p. 779-792. (2.337 - IF2016). ISSN 1860-5397.

3. ECKSTEIN ANDICSOVÁ, Anita - DANKO, Martin - MOSNÁČEK, Jaroslav. Amphiphilic copolymers based particles with potential uses in drug delivery systems. In Frontiers in Polymer Science : fifth international symposium : in assotiation with the journal polymer : abstracts. - Seville, Spain : Elsevier, 2017, non p., [P1.129].

4. DANKO, Martin - *ĎURKÁČOVÁ, Slávka* - MOSNÁČEK, Jaroslav. Functional polyesters from tulipaline a and epsilon-caprolactone. In ChemZi: Slovenský časopis o chémii pre chemické vzdelávanie, výskum a priemysel, 2017, roč. 13, č. 1, s. 110-111. ISSN 1336-7242.

5. DANKO, Martin - *ĎURKÁČOVÁ, Slávka* - MOSNÁČEK, Jaroslav. Tulipaline a and epsilon-caprolactone ROC - polyesters with double bond functionality. In ICBP 2017 with BCRS - Taiwan Annual Meeting. - Yuan Ze, Taiwan: Yuan Ze University, 2017, p. 120

29.) LiKoZIP: Lignín ako kompozitný komponent do fenolformaldehydových živíc a drevoplastu. *(Lignin as composite component for phenol-formaldehyde resins and wood-plastic composite.)*

Zodpovedný riešiteľ:	Dušan VELIČ
Zodpovedný riešiteľ v organizácii SAV:	Michal PROCHÁZKA
Trvanie projektu:	1.07.2016 / 30.06.2020
Evidenčné číslo projektu:	APVV-15-0201
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Medzinárodné laserové centrum, Bratislava
Počet spoluriešiteľských inštitúcií:	5

Čerpané financie: APVV: 3000 €

Dosiahnuté výsledky:
Pomocou rôznych analytických metód boli charakterizované všetky suroviny používané na prípravu fenolických živín, hlavne lignínu. Keďže lignín pochádzal z rôznych zdrojov, analýzy boli zamerané na charakterizáciu jednotlivých typov lignínov. Boli odhalené rozdiely v zložení dodávaných typov lignínov a to najmä rôzny obsah solí, ktorý spôsobuje rozličný typ spracovania a úpravy lignínu. Tieto rozdiely musia byť následne zohľadnené pri samotnej príprave fenolových živíc, nakoľko rozdielne chemické zloženie zmesí môže ovplyvňovať konečné vlastnosti produktu. Boli merané mechanické vlastnosti vzoriek preglejovaných dosiek lepených pomocou pripravených fenolických živíc s prídavkom lignínu. Pri týchto meraniach boli sledované rozdiely v mechanických vlastnostiach závislé od spôsobu prípravy dosiek.
V tomto roku začali testy aj drevoplastových kompozitov na báze PVC a lignínu. Pomocou rôznych analytických metód boli testované a charakterizované všetky vstupné suroviny, dodané z poloprevádzky. Taktiež boli testované mechanické vlastnosti prvých vzoriek drevoplastových kompozitov. Tieto práce budú pokračovať intenzívnejšie v ďalšom období.

Výstupy:

1. PROCHÁZKA, Michal - NÓGELLOVÁ, Zuzana - J. PALUŠ, J. - MAJERČÍKOVÁ, L. – VELIČ, D. Lignín ako zložka fenolformaldehydových živíc. In ChemZi : Slovenský časopis o chémii pre chemické vzdelávanie, výskum a priemysel, 2017, roč. 13, č. 1, s. 11-15. ISSN 1336-7242. Typ: AFH

30.) MOR4CML: Multivalentný morpholino-based antisense system pre CML. *(Multivalent morpholino-based antisense system for CML.)*

Zodpovedný riešiteľ:	Filip RÁZGA
Trvanie projektu:	1.7.2016 / 30.6.2020
Evidenčné číslo projektu:	APVV-15-0215
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 40 928 € pre ÚPo (celkove 55 602 €)

Dosiahnuté výsledky:
• Syntéza stavebných blokov a ich oligomerizácia do vyšších oligomérov
• Funkčná modifikácia oligonukleotidov pre potreby konjugačných reakcií
• Príprava prekurzorov pre konjugačné reakcie
• Príprava polymérneho komponentu plánovaného na konjugáciu
• Príprava liekového nosiča na báze chitozánu
• Charakterizácia a in vitro testovanie liekových nosičov na báze chitozánu a jeho derivátov

Výstupy:

1. MAZANCOVÁ, Petra - NÉMETHOVÁ, Veronika - LACÍK, Igor - RÁZGA, Filip. Chitosan-based particles: The (forgotten) interplay between process, properties and performance. In Materials Science and Engineering C: Materials for Biological Applications, 2017, vol. 71, p. 570-571. (4,164 - IF2016). ISSN 0928-4931.

2. NÉMETHOVÁ, Veronika - RÁZGA, Filip. Overexpression of ABCB1 as prediction marker for CML: How close we are to translation into clinics? In Leukemia, 2017, vol.31, no.1, p. 266-267.

(11,702 - IF2016). ISSN 0887-6924.

3. RÁZGA, Filip - NÉMETHOVÁ, Veronika. Gene expression patterns as predictive biomarkers in hematology-oncology, principal hurdles on the road to the clinic. In Haematologica : the hematology journal, 2017, vol. 102, p. e31-e32. (7,702 - IF2016). ISSN 0390-6078.

4. RÁZGA, Filip- NÉMETHOVÁ, Veronika. Selective therapeutic intervention: A challenge against off-target effects. In Trends in Molecular Medicine, 2017, vol. 23, no. 8, p. 671-674. (10.732 - IF2016). ISSN 1471-4914.

5. RÁZGA, Filip - NÉMETHOVÁ, Veronika. A method for altering the functional state of MRNA allowing its selective and specific recognition : International Publication Number: WO 2017/065696 A2. International Publication Date: 20.4. 2017. International Application Number: PCT/SK2016/060002. International Filing Date: 12.10. 2016. Priority Data: PP 50065-2015 15.10. 2015. Applicant: Ústav polymérov SAV, Dúbravská cesta 9, 845 41 Bratislava. International Bureau : World Intellectual Property Organization, 2017. 16 s.

6. MAZANCOVÁ, Petra - TREĽOVÁ, Dušana - NÉMETHOVÁ, Veronika - KLEŠČÍKOVÁ, Lucia - LACÍK, Igor - RÁZGA, Filip. Chitosan/TPP particles at physiological pH: do they exist at all? In Biomedizinische Technik, 2017, vol. 62, no. S2, p. 64. (0,915 - IF2016). ISSN 0013-5585.

7. KLEŠČÍKOVÁ, Lucia - NÉMETHOVÁ, Veronika - SORAL, M. - RÁZGA, Filip. A versatile approach for nucleobase modification. In 1st Symposium on Nucleic Acid Modifications : 4-6 September 2017 : book of abstracts. - Mainz, Germany : Institute of Molecular Biology, 2017, p. 82.

8. MAZANCOVÁ, Petra - RÁZGA, Filip - NÉMETHOVÁ, Veronika - LACÍK, Igor. Straightforward but non-trivial concept of chitosan-TTP particles. In Biomedicínske centrum SAV. Genetic toxicology and cancer prevention : book of abstracts. - Bratislava : Cancer research institute, Biomedical research center, 2017, p. 16-17. ISBN 978-80-972247-2-1.(Genetic toxicology and cancer prevention : Bilateral Czech and Slovak meeting).

9. NÉMETHOVÁ, Veronika - RÁZGA, Filip - MAZANCOVÁ, Petra - SVITKOVÁ, B. - BÁBELOVÁ, A. - ŠELC, M. - GÁBELOVÁ, A. Nanoparticle characterization is critical for correct interpretation of biological data. In Biomedicínske centrum SAV. Genetic toxicology and cancer prevention : book of abstracts. - Bratislava : Cancer research institute, Biomedical research center, 2017, p. 18-19. ISBN 978-80-972247-2-1.

10. RÁZGA, Filip - NÉMETHOVÁ, Veronika. Therapy resistance in CML: The complexity that stands behind. In Biomedicínske centrum SAV. Genetic toxicology and cancer prevention : book of abstracts. - Bratislava : Cancer research institute, Biomedical research center, 2017, p. 20. ISBN 978-80-972247-2-1.(Genetic toxicology and cancer prevention : Bilateral Czech and Slovak meeting).

11. MAZANCOVÁ, Petra – NÉMETHOVÁ, Veronika – TREĽOVÁ, Dušana – KLEŠČÍKOVÁ, Lucia – LACÍK, Igor – RÁZGA, Filip. Dissociation of chitosan/tripolyphosphate complexes into separate components upon pH elevation. Odoslané do Carbohydrate Polymers, (4,811-IF2016).

12. NÉMETHOVÁ, Veronika – RÁZGA, Filip. CML on target. Odoslané do Cancer Medicine. (3,362-IF2016).

31.) ENDONANOSAFE: Potenciálne riziko nanočastíc kovov a oxidov kovov používaných v nanomedicíne: vplyv na reprodukčný a imunitný systém a mozog. *(Potential risk of metal and metal oxide nanoparticles used for biomedical aplications: focus on reproductive and immune systems and brain.)*
/

Zodpovedný riešiteľ:	Soňa SCSUKOVÁ
Zodpovedný riešiteľ v organizácii SAV:	Jozef KOLLÁR
Trvanie projektu:	1.07.2016 / 30.06.2020
Evidenčné číslo projektu:	APVV-15-0296
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Biomedicínske centrum SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 8000 €

Dosiahnuté výsledky:
V druhom roku riešenia projektu sme v súlade s plánovanými cieľmi projektu pokračovali v testovaní a hodnotení toxicity vybraných komerčne dostupných kovových nanočastíc (striebro, zlato) a nanočastíc oxidov kovov (oxid titaničitý) v závislosti od ich veľkosti (10, 20 a 100 nm) a koncentrácie v in vitro podmienkach vo vybraných bunkových líniách (MCF7, ACHN, TM3) a primárnych bunkových kultúrach (ovariálne granulózne bunky, Leydigove bunky). Pomocou metódy DLS sa súčasne stanovila veľkosť, distribúcia a zeta potenciál testovaných nanočastíc.

Výstupy:

1. KOLLÁR, Jozef - MRLÍK, M. - HRČKOVÁ, Ľudmila - LUK, S. B. - MOSNÁČEK, Jaroslav. Renewable butyrolactone monomers for the preparation of hydrogels and polymeric nanoparticles. In DVSPM 2017: Danube Vltava Sava Polymer Meeting : book of abstracts. - Vienna, Austria: Institute of Applied Synthetic Chemistry TU Wien, 2017, abstract no. OP-37. ISBN 978-3-9504017-6-9.

2. KOLLÁR, Jozef - MRLÍK, M. - HRČKOVÁ, Ľudmila - MOSNÁČEK, Jaroslav. Bio-derived butyrolactone monomers for the preparation of hydrogels and nanoparticles. In Bypos: 7th Bratislava Young Polymer Scientists Wokshop: workshop book. - Bratislava: Young Scientist Council of Polymer Institute SAS, 2017, p. 71. ISBN 978-80-89841-05-9.

32.) FYVLASOVMAC: Fyzikálne vlastnosti organických látok a vody uväznených v mezopóroch anorganických matríc. *(Physical properties of organic compounds and water confined in mesopores of inorganic matrices.)*

Zodpovedný riešiteľ:	Ondrej ŠAUŠA
Zodpovedný riešiteľ v organizácii SAV:	Josef BARTOŠ
Trvanie projektu:	1.07.2017 / 30.06.2021
Evidenčné číslo projektu:	APVV 16-0369
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Fyzikálny ústav SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 6640 €

Dosiahnuté výsledky:
V počiatočnej etape riešenia tohto APVV 2017 projektu sa v nadväznosti na publikované ESR, PALS a BDS výsledky na typickom modelovom polárnom protickom médiu 1-propanolu (1-PrOH) [J. Bartoš et al. J.Phys.-Cond.Matter 28,015101(2016)] pokračovalo systematickým štúdiom 1-PrOH priestorovo-limitovaného v sérii SiO2 matríc s pravidelnými (SBA-15) ako aj nepravidelnými (SG) pórami. Zistilo sa, že v kontraste s nepolárnymi médiami ako sú hexadekán

(HXD) [M. Lukešová et al. Eur.Phys.J.88,46 2015] a cyklohexán (CHX) [nepublikované dáta] je redukcia mobility spinovej sondy TEMPO podstatne menšia a citlivosť dynamiky k veľkosti pórov podstatne väčšia v dôsledku dominancie geometrického ohraničujúceho efektu pórov SG matric na štrukturálno-dynamické pomery v uväznenom 1-PrOH médiu.

Výstupy:

1. ŠAUŠA, O. - LUKEŠOVÁ, Miroslava- ŠVAJDLENKOVÁ, Helena - BARTOŠ, Josef. Free-volume evolution of 1-propanol confined in variously filled regular mesopores of SBA-15 matrix. Acta Physica Polonica A –AphysPolAA.XX.TEMP-9502- F - odoslané

33.) MoSence: Inovatívna MoS2 platforma pre diagnózu a cielenú liečbu rakoviny. *(Smart MoS2 platform for cancer diagnosis and targeted treatment.)*

Zodpovedný riešiteľ:	Peter ŠIFFALOVIČ
Zodpovedný riešiteľ v organizácii SAV:	Matej MIČUŠÍK
Trvanie projektu:	1.07.2016 / 30.06.2020
Evidenčné číslo projektu:	APVV-15-0641
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Fyzikálny ústav SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 11500 €

Dosiahnuté výsledky:

Pokračujeme v naviazaní a charakterizovaní NH2 skupín a následne aj vznik NC=O amidovej skupiny na povrchu MoS2. V prípade MoS2 sme narazili aj na zaujímavý jav tvorby oxidových nanočastíc v roztoku v závislosti od koncentrácie MoS2. Najnovšie analýzy naznačujú, že MoS2 má zrejme nejaké defektné časti (prípadne priamo nejaké znečistenie), ktoré ovplyvňujú pH, ktoré pri zvýšenej koncentrácii MoS2 výrazne klesá a akceleruje oxidáciu a tvorbu MoOx nanočastíc. Toto pozorovanie už bolo opublikované v celku kvalitnom časopise, kde sa mylne domnievali, že pripravili MoS2 quantum dots, zatiaľ čo modré sfarbenie roztoku pochádzalo zrejme práve z týchto MoOx nanočastíc. Tento jav momentálne študujeme podrobnejšie, hlavne v spolupráci s Michalom Bodíkom a Petrom Šiffalovičom z FÚ.

Výstupy:

1. BODÍK, M. - ZAHORANOVÁ, A. - MIČUŠÍK, Matej - BUGÁROVÁ, Nikola - ŠPITÁLSKY, Zdenko - OMASTOVÁ, Mária - MAJKOVÁ, E. - JERGEL, M. - ŠIFFALOVIČ, P. Fast low-temperature plasma reduction of monolayer graphene oxide at atmospheric pressure. In Nanotechnology, 2017, vol. 28, art.no. 145601. (3.440 - IF2016). ISSN 0957-4484. Typ: ADCA

2. BUGÁROVÁ, Nikola - PROCHÁZKA, Michal - BODÍK, M. - MIČUŠÍK, Matej - ŠIFFALOVIČ, P. - OMASTOVÁ, Mária. Inorganic-organic hybrid nanoplastforms for cancer diagnosis. In chem2Dmat : Strasbourg 22-26 August 2017: information and conference booklet. - Strasbourg, France : Université de Strasbourg, 2017, p67. Typ: AFG

3. MIČUŠÍK, Matej - BUGÁROVÁ, Nikola - BODÍK, M. - ŠIFFALOVIČ, P. - KOLLÁR, Jozef - ŠPITÁLSKY, Zdenko - OMASTOVÁ, Mária. MoS2 and graphene oxide nanoplatforms for detection of cancer. In ICONAN 2017 : International Conference on Nanomedicine and Nanobiotechnology : book of abstracts. - Barcelona, Spain : Pompeu Fabra University, Barcelona, 2017, p. 168. Dostupné na internete: . Typ: AFG

34.) PLAZTEXNANO: Výskum vplyvu nízkoteplotnej plazmy na zvýšenie povrchovej permanentnosti úpravy textilných materiálov s použitím nanosólov. *(Research of the impact of low temperature PLASma on increase the surface treatment permanence of TEXtile materials using NANOsols.)*

Zodpovedný riešiteľ:	Zdenko ŠPITÁLSKY
Trvanie projektu:	1.07.2015 / 31.12.2017
Evidenčné číslo projektu:	APVV-14-0518
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 45 000 € pre ÚPo (celkove 90 000 €)

Dosiahnuté výsledky:

V poslednom roku riešenia projektu sme sa zamerali na textílie typu polyamid a zmesná polyester/bavlna. U oboch sa potvrdilo rovnaké správanie účinku plazmy, ako u predchádzajúcich textílií. Zároveň sa preukázal pozitívny vplyv povrchovej úpravy plazmy na funkčné vlastnosti textílií.

Výstupy:

1. NOVÁK, Igor - *VALENTIN, Marian* - ŠPITÁLSKY, Zdenko - *POPELKA, Anton* - ŠESTÁK, J. - *KRUPA, Igor.* Superhydrophobic polyester-based fabrics modified by barrier discharge plasma and organosilanes. In Odpadové fórum 2017 : Výsledky výzkumu a vývoje pro prumyslovou a komunální ekologii - 12.ročník : proceedings. - Praha, ČR : CEMC, 2017, [5p.]. ISBN 978-80-85990-30-0. Typ: AFC

2. NOVÁK, Igor - ŠPITÁLSKY, Zdenko - RÁSTOČNÁ-ILLOVÁ, D. - ŽIGO, Ondrej - MIČUŠÍK, Matej - NÓGELLOVÁ, Zuzana - KLEINOVÁ, Angela. Polypropylene fabrics pre-treated by atmospheric plasma. In Odpadové fórum 2017 : Výsledky výzkumu a vývoje pro prumyslovou a komunální ekologii - 12.ročník : proceedings. - Praha, ČR : CEMC, 2017, [6p.]. ISBN 978-80-85990-30-0. Typ: AFC

3. ŠPITÁLSKY, Zdenko - KOVÁČOVÁ, Mária - ŽIGO, Ondrej - NOVÁK, Igor - KLEINOVÁ, Angela - MIČUŠÍK, Matej - NÓGELLOVÁ, Zuzana - RÁSTOČNÁ ILLOVÁ, D. Innovative technologies for application in automotive textile. In PMA 2017 & SRC 2017 : International Conference on Polymeric Materials in Automotive : 23rd Slovak Rubber Conference : book of proceedings. - Bratislava, Slovakia : Slovak University of Technology, Faculty of Chemical and Food Technology & Polymer Institute of SAS, 2017, p. 117-118. ISBN 978-80-89841-04-2.(PMA 2017 & SRC 2017 : International Conference on Polymeric Materials in Automotive : Slovak Rubber Conference). Typ: AFH

4. ŠPITÁLSKY, Zdenko - KOVÁČOVÁ, Mária - ŽIGO, Ondrej - NOVÁK, Igor - KLEINOVÁ, Angela - MIČUŠÍK, Matej - NÓGELLOVÁ, Zuzana - RÁSTOČNÁ ILLOVÁ, D. Výskum vplyvu nízkoteplotnej plazmy na zvýšenie permanentnosti povrchovej úpravy textilných materiálov s použitím nanosólov. In ChemZi : Slovenský časopis o chémii pre chemické vzdelávanie, výskum a priemysel, 2017, roč. 13, č. 1, s. 107. ISSN 1336-7242. Typ: AFH

Príloha C

Publikačná činnosť organizácie (*generovaná z ARL*)

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ADCA18 FILIP, J. - ECKSTEIN ANDICSOVÁ, Anita - VIKARTOVSKÁ, A., Welwardová - TKÁČ, J. Immobilization of bilirubin oxidase on graphene oxide flakes with different negative charge density for oxygen reduction. The effect of GO charge density on enzyme coverage, electron transfer rate and current density. In Biosensors & Bioelectronics, 2017, vol. 89, p. 384-389. (7.780 - IF2016). (2017 - Current Contents). ISSN 0956-5663.

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2. [1.2] MELENTYEV, S.V.- MALINOVSKAYA, T.D.- PAVLOV, S.V. Influence of carbon fillers nature on the structural and morphological properties of polyurethane-based composites. (2016) AIP Conference Proceedings, 1698, art. no. 050006,DOI: 10.1063/1.4937855, Scopus

Príloha D

Údaje o pedagogickej činnosti organizácie

Semestrálne prednášky:

RNDr. Peter CIFRA, DrSc.
Názov semestrálneho predmetu: Makromolekulová chémia
Počet hodín za semester: 16
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, 4 -5 ročník

Mgr. Juraj KRONEK, PhD.
Názov semestrálneho predmetu: Makromolekulová chémia
Počet hodín za semester: 6
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, 4 - 5 ročník

Mgr. Juraj KRONEK, PhD.
Názov semestrálneho predmetu: Progress in Biomaterials Research and Biomedical Polymers
Počet hodín za semester: 60
Názov katedry a vysokej školy: Jan Dlugos University Czestochowa, Poľsko, -

Mgr. Zuzana KRONEKOVÁ, PhD.
Názov semestrálneho predmetu: Progress in Biomaterials Research and Biomedical Polymers
Počet hodín za semester: 60
Názov katedry a vysokej školy: Jan Dlugos University Czestochowa, Poľsko, -

Ing. Igor LACÍK, DrSc.
Názov semestrálneho predmetu: Polymers in water: radical polymerization kinetics, hydrogels, and surfaces
Počet hodín za semester: 10
Názov katedry a vysokej školy: Kyushu University, Japonsko, pre doktorandov

Ing. Igor LACÍK, DrSc.
Názov semestrálneho predmetu: Radikálová polymerizácia
Počet hodín za semester: 14
Názov katedry a vysokej školy: Kyushu University, Japonsko, MSc študenti

Semestrálne cvičenia:

Mgr. Zuzana BENKOVÁ, PhD.
Názov semestrálneho predmetu: Molekulová dynamika
Počet hodín za semester: 3
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Študenti 4 ročníka štúdia na Katedre fyzikálnej a teoretickej chémie

Ing. Peter ČAKÁNEK
Názov semestrálneho predmetu: Základné cvičenie z fyzikálnej chémie
Počet hodín za semester: 5
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedre fyzikálnej a teoretickej chémie -študenti 2 ročníka

Semináre:

Mgr. Zuzana BENKOVÁ, PhD.
Názov semestrálneho predmetu: Molekulová dynamika
Počet hodín za semester: 2

Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Študenti 4 ročníka štúdia na Katedre fyzikálnej a teoretickej chémie

Terénne cvičenia:

Mgr. Martin DANKO, PhD.
Názov semestrálneho predmetu: vedenie odbornej praxe študenta Martina Országa z Gymnázium I. Lettricha v Martine
Počet hodín za semester: 240
Názov katedry a vysokej školy: Ústav polymérov SAV, Bratislava, -

Ing. Anita ECKSTEIN, PhD.
Názov semestrálneho predmetu: Biodegradovateľné obalovacie materiály pre kozmetické účely - vedenie SAIA šipendistky Joanna Ryz Centre of Polymer and Carbon Materials, Polish Academy of Sciences
Počet hodín za semester: 180
Názov katedry a vysokej školy: Ústav polymérov SAV, Bratislava, -

Ing. Anita ECKSTEIN, PhD.
Názov semestrálneho predmetu: príprava biokompatibilných amfifilných polymérnych nanočastíc-vedenie študentiek zo súkromného gymnázia Mercury na technickej výpomoci: Kataríny Sujovej a Alexandry Mýtnikovej
Počet hodín za semester: 60
Názov katedry a vysokej školy: Ústav polymérov SAV, Bratislava, -

Ing. Anita ECKSTEIN, PhD.
Názov semestrálneho predmetu: Príprave nanočastíc z hodvábu - vedenie študentky zo zahraničia na technickej výpomoci: Réka Penzinger z University College London
Počet hodín za semester: 120
Názov katedry a vysokej školy: Ústav polymérov SAV, Bratislava, -

Ing. Igor LACÍK, DrSc.
Názov semestr. predmetu: -
Počet hodín za semester: 80
Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, vedenie diplomovej práce Martina Barloga

Mgr. Jaroslav MOSNÁČEK, DrSc.
Názov semestrálneho predmetu: vedenie študenta Krzsytofa Jercyznskeho zo zahraničia (Politechnika Lodzska) v rámci programu ERASMUS
Počet hodín za semester: 200
Názov katedry a vysokej školy: Ústav polymérov SAV, Bratislava, -

Ing. Alena ŠIŠKOVÁ, PhD.
Názov semestrálneho predmetu: Elektrostatické zvlákňovanie prírodných polymérov, hodváb a kyselina hyaluronová pre medicínske využitie
Počet hodín za semester: 120
Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, vedenie študentky magisterského štúdia Barbory Lišívkovej

Ing. Alena ŠIŠKOVÁ, PhD.
Názov semestrálneho predmetu: Výpomoc v LC laboratóriu a na elektrospinningu pri príprave roztokov a štúdiu vplyvu parametrov pri zvlákňovaní derivátov cyklodextrínu-vedenie študentky zo

zahraničia na technickej výpomoci: Dorota Gašparíková z University of Warwick
Počet hodín za semester: 120
Názov katedry a vysokej školy: Ústav polymérov SAV, Bratislava, -

Mgr. Anna ZAHORANOVÁ, PhD.
Názov semestrálneho predmetu: -
Počet hodín za semester: 80
Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, vedenie diplomovej práce Moniky Majerčíkovej

Individuálne prednášky:

RNDr. Peter CIFRA, DrSc.
Názov semestrálneho predmetu: Makromolekulová chémia
Počet hodín za semester: 2
Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, prednášky pre doktorandov

Prof. Ing. Ivan CHODÁK, DrSc.
Názov semestrálneho predmetu: Makromolekulová chémia
Počet hodín za semester: 4
Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, prednášky pre doktorandov

Ing. Mária OMASTOVÁ, DrSc.
Názov semestrálneho predmetu: Makromolekulová chémia
Počet hodín za semester: 2
Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, prednáška pre doktorandov (1. ročník)

Ing. Jozef RYCHLÝ, DrSc.
Názov semestrálneho predmetu: Makromolekulová chémia
Počet hodín za semester: 2
Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, prednáška pre doktorandov

Mgr. Zdenko ŠPITÁLSKY, PhD.
Názov semestrálneho predmetu: Makromolekulová chémia
Počet hodín za semester: 2
Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, prednáška pre doktorandov

Príloha E

Medzinárodná mobilita organizácie

(A) Vyslanie vedeckých pracovníkov do zahraničia na základe dohôd:

Krajina	**D r u h d o h o d y**					
	MAD, KD, VTS		**Medziústavná**		**Ostatné**	
	Meno pracovníka	**Počet dní**	**Meno pracovníka**	**Počet dní**	**Meno pracovníka**	**Počet dní**
Česko	Ivica Janigová	7	Dmitrij Bondarev	6	Eliška Číková	1
			Katarína Borská	365	Martin Danko	1
			Mária Kováčová	31	Ana Hološ	1
			Miroslava Lukešová	365	Ana Hološ	1
			Veronika Némethová	1	Ana Hološ	2
			Veronika Némethová	1	Angela Kleinová	3
			Kristián Peptu	6	Mária Kováčová	2
			Filip Rázga	1	Juraj Kronek	1
			Filip Rázga	1	Juraj Kronek	1
					Igor Lacík	2
					Igor Lacík	1
					Igor Lacík	3
					Zoran Markovic	1
					Zoran Markovic	1
					Zoran Markovic	2
					Jaroslav Mosnáček	1
					Igor Novák	2
					Mária Omastová	1
					Mária Omastová	1
					Zdenko Špitálsky	2
Francúzsko			Mária Omastová	3		
Japonsko			Igor Lacík	30		
Katar			Martin Danko	32		

			Jaroslav Mosnáček	32		
			Zdenko Špitálsky	60		
Kórejská republika			Mária Omastová	6		
Luxembursko			Štefan Chmela	3		
Maďarsko	Jaroslav Mosnáček	5				
	Katarína Mosnáčková	4				
	Alena Šišková	4				
Malta			Mária Omastová	2		
Nemecko			Mária Omastová	7		
Poľsko	Martin Danko	6	Juraj Kronek	24		
	Jaroslav Mosnáček	6	Zuzana Kroneková	27		
	Katarína Mosnáčková	4				
	Alena Šišková	4				
Portugalsko			Zuzana Benková	60		
Rakúsko			Zuzana Benková	4	Ivan Chodák	1
			Matej Mičušík	1		
			Matej Mičušík	1		
			Mária Omastová	1		
			Silvia Podhradská	1		
			Silvia Podhradská	1		
Srbsko			Jaroslav Kuliček	9		
			Zoran Markovic	9		
			Zoran Markovic	10		
			Zoran Markovic	9		
			Matej Mičušík	3		
Taiwan			Jaroslav Mosnáček	10		
Taliansko	Alena Šišková	3	Anna	75		

			Zahoranová			
			Anna Zahoranová	17		
Turecko			Jaroslav Kuliček	7		
USA			Igor Lacík	5		
			Igor Lacík	4		
Veľká Británia			Kristián Peptu	8		
Počet vyslaní spolu	**9**	**43**	**39**	**1238**	**21**	**31**

(B) Prijatie vedeckých pracovníkov zo zahraničia na základe dohôd:

Krajina	**D r u h d o h o d y**					
	MAD, KD, VTS		**Medziústavná**		**Ostatné**	
	Meno pracovníka	**Počet dní**	**Meno pracovníka**	**Počet dní**	**Meno pracovníka**	**Počet dní**
Belgicko					Hoogenboom R.	3
Česko	Stejskal J.	5			Bober P.	2
	Špírková M.	5			Hrubý M.	2
	Trchová M.	5			Pfleger J.	2
					Stejskal J.	2
Irán			Lanjabi P.M.	62	Namazi H.	2
Kanada			Ezanwajiaku I. H.	92		
Maďarsko	Bencskó G.	5				
	Iván B.	2				
	Pásztoi B.	5				
Nemecko					Friedrich J. F.	2
Poľsko	Adamus G.	6	Jerczynski K.	14		
	Basko M.	7	Kawalec M.	87		
	Musiol M.	6	Rydz-Pawlak J.	118		
	Sikorska W.	6				
	Socka M.	7				
Rusko			Nikitin A.	62		
Srbsko			Budimir M.	6		
			Kepić D.	11		
			Kepić D.	5		
			Markovic B.	6		
			Prekodravac J.	6		
Španielsko			Alfonzo M.	60		
Taiwan					Huang Ch. F.	2
Taliansko	Kozma E.	5				
Veľká Británia			Penzinger R.	59		
Počet	**12**	**64**	**13**	**588**	**8**	**17**

(C) Účasť pracovníkov pracoviska na konferenciách v zahraničí (nezahrnutých v "A"):

Krajina	Názov konferencie	Meno pracovníka	Počet dní
Belgicko	Advanced Polymers via Macromolecular Engineering	Igor Lacík	5
Brazília	46th IUPAC World Chemistry Congress	Igor Lacík	6
Bulharsko	19th International Conference Materials, Methods &	Jaroslav Mosnáček	8
	19th International Conference Materials, Methods &	Katarína Mosnáčková	8
	19th International Conference Materials, Methods &	Kristián Peptu	11
Cyprus	Electrospinning COST Action MP1206 on Electrospinn	Mária Omastová	6
Česko	(bio) Macromolecular Ionic Systems 2017	Zuzana Benková	5
	81st Prague Meeting on Macromolecules	Matej Mičušík	5
	8th Green Chemistry and Workshop Nanotechnologies	Eliška Číková	4
	8th Green Chemistry and Workshop Nanotechnologies	Anita Eckstein	4
	APROCHEM 2017	Igor Novák	2
	RubberCon	Ivan Chodák	4
Čína	International Conference on Functional Materials a	Kristián Peptu	8
Francúzsko	25th International Conference on Bioencapsulation	Zuzana Kroneková	4
	25th International Conference on Bioencapsulation	Igor Lacík	4
	9th European Symposium on Biopolymers	Ivan Chodák	4
Grécko	Eurofillers Polymer Blends 2017	Ivan Chodák	7
	Eurofillers Polymer Blends 2017	Mária Omastová	7
	The Graphene Week 2017	Nikola Bugárová	6
Chorvátsko	Multi-Functional Nano-Carbon Composite Materials -	Matej Mičušík	4
Kórejská republika	4th International Conference on Advanced Electroma	Mária Omastová	4
Maďarsko	1st Journal of Thermal Analysis and Calorimetry Co	Ivica Janigová	4
Malta	International Summit on Stability of Organic and P	Mária Omastová	4
Nemecko	1st Symposiun on Nucleic Acid Modifications	Lucia Kleščíková	5
	1st Symposiun on Nucleic Acid Modifications	Veronika Némethová	5

	1st Symposiun on Nucleic Acid Modifications	Filip Rázga	5
	Annual Meeting of the German Society for Biomaterials	Petra Mazancová	3
	Annual Meeting of the German Society for Biomateri	Filip Rázga	3
	WITech Symposium 2017	Zuzana Kroneková	3
	WITech Symposium 2017	Michal Pelach	3
	XXVII. International EPR Seminar	Josef Bartoš	4
	XXVII. International EPR Seminar	Helena Švajdlenková	4
Poľsko	12th International Workshop on Positron and Positronium Chemistry	Josef Bartoš	7
	12th International Workshop on Positron and Positronium Chemistry	Helena Švajdlenková	7
	2nd Innternational Scientific Conference Wood, Sc	Igor Novák	4
	3rd International Conference on Wood, Composites,	Igor Novák	3
	6th Young European Scientists 2017 Workshop	Petra Šrámková	5
	International Workshop on Polymer Science and Poly	Juraj Kronek	3
	International Workshop on Polymer Science and Poly	Katarína Mosnáčková	1
	International Workshop on Polymer Science and Poly	Alena Šišková	1
	Workshop projektu V4 ABIOG	Juraj Kronek	3
	Workshop projektu V4 ABIOG	Kristián Peptu	3
Portugalsko	MC/WG Meeting COST Action no. MP 1307 and Industry	Mária Omastová	4
	MC/WG Meeting COST Action no. MP 1307 and Industry	Michal Procházka	4
Rakúsko	Austrian Chemistry Days	Mária Omastová	4
	Danube Vltava Sava Polymer Meeting 2017	Eva Habánková	4
	Danube Vltava Sava Polymer Meeting 2017	František Ivanič	4
	Danube Vltava Sava Polymer Meeting 2017	Jozef Kollár	4
	Danube Vltava Sava Polymer Meeting 2017	Igor Lacík	4
	Danube Vltava Sava Polymer Meeting 2017	Kristián Peptu	6
	Danube Vltava Sava Polymer Meeting 2017	Lucia Rišpanová	4
	Danube Vltava Sava Polymer Meeting 2017	Helena Švajdlenková	4

	Danube Vltava Sava Polymer Meeting 2017	Anna Zahoranová	4
Srbsko	Graphene–based Components and Flexible Electronic/	Zoran Markovic	5
Španielsko	3rd World Congress on Materials Science and Engine	Jaroslav Mosnáček	5
	3rd World Congress on Materials Science and Engine	Katarína Mosnáčková	5
	5th International Symposium Frontiers in Polymer Science	Peter Cifra	5
	5th International Symposium Frontiers in Polymer S	Anita Eckstein	5
	5th International Symposium Frontiers in Polymer S	Katarína Mosnáčková	5
	5th International Symposium Frontiers in Polymer S	Lucia Rišpanová	5
	5th International Symposium Frontiers in Polymer S	Alena Šišková	5
	Materials Science and Nanoscience 2017	Eliška Číková	5
	International Conference on Nanomedicine and Nanobi	Matej Mičušík	5
Švédsko	Last MC Meeting COST Action FP 1205	Alena Šišková	3
Taiwan	ICBP 2017	Martin Danko	10
Taliansko	Spin-2017: The 8th Conference On Nitroxides	Josef Bartoš	8
	Spin-2017: The 8th Conference On Nitroxides	Helena Švajdlenková	8
	Workshop on Italian-Nordic Polymer Future	Anita Eckstein	6
	Workshop on Italian-Nordic Polymer Future	Alena Šišková	3
Veľká Británia	2017 Thermo Fisher Scientific XPS User Meeting	Matej Mičušík	3
	2017 Thermo Fisher Scientific XPS User Meeting	Mária Omastová	3
Spolu	**44**	**71**	**336**

Vysvetlivky: MAD - medziakademické dohody, KD - kultúrne dohody, VTS - vedecko-technická spolupráca v rámci vládnych dohôd

Skratky použité v tabuľke C:

ICBP 2017 - 6th International Conference on Biobased Polymers ICBP 2017
(bio) Macromolecular Ionic Systems 2017 - (bio) Macromolecular Ionic Systems 2017
12th Int.W on Positron and Positronium Chemistry - 12th International Workshop on Positron and Positronium Chemistry
12th International Workshop on Positron and Positr - 12th International Workshop on Positron and Positronium Chemistry
19th International Conference Materials, Methods & - 19th International Conference Materials, Methods & Technologies
1st Journal of Thermal Analysis and Calorimetry Co - 1st Journal of Thermal Analysis and Calorimetry Conference and

6th V4 Thermoanalytical Conference
1st Symposiun on Nucleic Acid Modifications - 1st Symposiun on Nucleic Acid Modifications
2017 Thermo Fisher Scientific XPS User Meeting - 2017 Thermo Fisher Scientific XPS User Meeting
25th International Conference on Bioencapsulation - 25th International Conference on Bioencapsulation (BGR 2017)
2nd Innternational Scientific Conference Wood, Sc - 2nd Innternational Scientific Conference Wood, Sciences, Economy
3rd International Conference on Wood, Composites, - 3rd International Conference on Wood, Composites, Modification and Machining
3rd World Congress on Materials Science and Engine - 3rd World Congress on Materials Science and Engineering 2017
46th IUPAC World Chemistry Congress - 46th IUPAC World Chemistry Congress
4th International Conference on Advanced Electroma - 4th International Conference on Advanced Electromaterials
5th Int. Symposium Frontiers in Polymer Science - 5th International Symposium Frontiers in Polymer Science
5th International Symposium Frontiers in Polymer S - 5th International Symposium Frontiers in Polymer Science
6th Young European Scientists 2017 Workshop - 6th Young European Scientists 2017 Workshop
81st Prague Meeting on Macromolecules - 81st Prague Meeting on Macromolecules
8th Green Chemistry and Workshop Nanotechnologies - 8th Green Chemistry and Workshop Nanotechnologies in Polymer Chemistry
9th European Symposium on Biopolymers - 9th European Symposium on Biopolymers
Advanced Polymers via Macromolecular Engineering - Advanced Polymers via Macromolecular Engineering
An. Meeting of the German Society for Biomaterials - Annual Meeting of the German Society for Biomaterials.
Annual Meeting of the German Society for Biomateri - Annual Meeting of the German Society for Biomaterials
APROCHEM 2017 - APROCHEM 2017
Austrian Chemistry Days - Austrian Chemistry Days
Danube Vltava Sava Polymer Meeting 2017 - Danube Vltava Sava Polymer Meeting 2017
Electrospinning COST Action MP1206 on Electrospinn - Electrospinning COST Action MP1206 on Electrospinning: From Design and Processing to Advanced Nanomaterials and Applications.
Eurofillers Polymer Blends 2017 - Eurofillers Polymer Blends 2017
Graphene–based Components and Flexible Electronic/ - Graphene–based Components and Flexible Electronic/Sensing Devices
International Conference on Functional Materials a - International Conference on Functional Materials and Biomaterials CFMB 2017
International Summit on Stability of Organic and P - International Summit on Stability of Organic and Perovskite Solar Cells
International Workshop on Polymer Science and Poly - International Workshop on Polymer Science and Polymeric Materials
Last MC Meeting COST Action FP 1205 - Last MC Meeting COST Action FP 1205
Materials Science and Nanoscience 2017 - Materials Science and Nanoscience 2017
MC/WG Meeting COST Action no. MP 1307 and Industry - MC/WG Meeting COST Action no. MP 1307 and Industry Day „Printed Electronis and Solar Cells“
Multi-Functional Nano-Carbon Composite Materials - - Multi-Functional Nano-Carbon Composite Materials - Scientific Meeting COST Action CA15107
nternational Conference on Nanomedicine and Nanobi - nternational Conference on Nanomedicine and Nanobiotechnology ICONAN 2017
RubberCon - RubberCon
Spin-2017: The 8th Conference On Nitroxides - Spin-2017: The 8th Conference On Nitroxides
The Graphene Week 2017 - The Graphene Week 2017
WITech Symposium 2017 - WITech Symposium 2017
Workshop on Italian-Nordic Polymer Future - Workshop on Italian-Nordic Polymer Future
Workshop projektu V4 ABIOG - Workshop projektu V4 ABIOG
XXVII. International EPR Seminar - XXVII. International EPR Seminar

Príloha F

Vedecko-popularizačná činnosť pracovníkov organizácie SAV

Meno	Spoluautori	Typ[1]	Názov	Miesto zverejnenia	Dátum alebo počet za rok
Ing. Róbert Balogh		PB	Príprava polyamidového vlákna z roztoku.	Deň otvorených dverí ÚPo SAV	9.11.2017
Ing. Róbert Balogh		PB	Dokážeme kopírovať prírodu?	Európska noc výskumníkov – 11. ročník, stánok ÚPo SAV pre verejnosť, Stará tržnica	25.09.2017
Ing. Róbert Balogh		PB	Nájdi v sebe vedca - organizované pre žiakov 5. ročníka ZŠ Pavla Mercelyho, Drieňová, Bratislava	ÚPo SAV	5.04.2017
Ing. Róbert Balogh		EX	Nájdi v sebe vedca - organizované pre žiakov 5. ročníka ZŠ Pavla Mercelyho, Drieňová, Bratislava	ÚPo SAV	4.05.2017
Ing. Róbert Balogh		EX	Príprava polyamidového vlákna z roztoku.	Deň otvorených dverí, ÚPo SAV	9.11.2017
Mgr. Zuzana Benková, PhD.		RO	Rozhovor	Rádio Regina	9.11.2017
Mgr. Zuzana Benková, PhD.		PB	Teoretická chémia – model DNA	Deň otvorených dverí, ÚPo SAV	9.11.2017
Mgr. Zuzana Benková, PhD.		EX	Teoretická chémia – model DNA	Deň otvorených dverí, ÚPo SAV	9.11.2017
Mgr. Martin Danko, PhD.		RO	rozhovor v cykle Príbeh na týždeň	Rádio Regina	2017
Ing. Anita Eckstein, PhD.		PB	Nájdi v sebe vedca - organizované pre žiakov 5. ročníka ZŠ Pavla Mercelyho, Drieňová, Bratislava	ÚPo SAV	5.04.2017
Ing. Anita Eckstein, PhD.		EX	Nájdi v sebe vedca - organizované pre žiakov 5. ročníka ZŠ Pavla Mercelyho, Drieňová, Bratislava	ÚPo SAV	4.05.2017
Ing. Eva Habánková		PB	Čo je alginát?	Deň otvorených dverí, ÚPo SAV	9.11.2017
Ing. Eva Habánková		PB	Dokážeme kopírovať prírodu?	Európska noc výskumníkov – 11. ročník, stánok ÚPo SAV pre verejnosť, Stará tržnica	25.09.2017
Prof. Ing. Ivan Chodák, DrSc.		RO	Naozaj? Sú plasty naozaj tak nebezpečné?	Rádio Regina - Západ	13.10.2017

Prof. Ing. Ivan Chodák, DrSc.		RO	Pitná voda może obsahovať kúsky plastov	Správy RTVS	7.09.2017
Mgr. Jozef Kollár, PhD.		RO	„Hydrogély“ – krátky vstup	Rádio Regina -západ	26.04.2017
Mgr. Jozef Kollár, PhD.		PB	Hydrogély – polyméry, ktoré majú rady vodu – vaša šálka vedomostí	Kaviareň SAVinci, Štefánikova 3, Bratislava	27.04.2017
Mgr. Zuzana Kroneková, PhD.	Danko Martin, Mičušík Matej, Benková Zuzana	RO	Rádiobudík	Rádio Regina	22.11.2017
Ing. Igor Lacík, DrSc.		TL	Akademici bez štátu	Trend, 2017/31, str. 11-13	2017
Ing. Igor Lacík, DrSc.		IN	Hosť rádia Regina	https://www.rtvs.sk/radio/archiv/1603/785761	12.10.2017
Ing. Igor Lacík, DrSc.		RO	Hosť rádia Regina	Rádio Regina	12.10.2017
Ing. Igor Lacík, DrSc.		PB	Kontrola hladiny glukózy transplantovanými enkapsulovanými ostrovčekmi: súčasná situácia	Prednáška pre lekárov DFNsP, Bratislava	5.06.2017
Ing. Igor Lacík, DrSc.		IN	Pohľad medzinárodného panelu nás potešil	http://www.sav.sk/index.php?lang=sk&doc=services-news&source_no=20&news_no=6772	19.03.2017
Ing. Igor Lacík, DrSc.		IN	Portrét TA3	http://www.ta3.com/clanok/1112836/portret-igora-lacika.html	16.09.2017
Ing. Igor Lacík, DrSc.		TV	Portrét TA3	TA3	16.09.2017
Ing. Igor Lacík, DrSc.		RO	Ústav polymérov patrí k svetovej spicke.	RTVS	24.02.2017
Ing. Igor Lacík, DrSc.		IN	Ústav polymérov patrí k svetovej spicke.	http://slovensko.rtvs.sk/clanky/veda-a-technika/127586/ustav-polymerov-patri-k-vedeckej-spicke	24.02.2017
Ing. Igor Lacík, DrSc.		TL	Veda môže byť naozaj krásna	Časopis Diabetik 5-6 2017, str. 8-12	2017
Ing. Igor Lacík, DrSc.		TL	Zo života Ústavu polymérov SAV	CHemZi, Slevenský časopis o chémii, ročník 13, číslo 1, str.18-19	2017
Mgr. Katarína Mosnáčková, PhD.		PB	Nájdi v sebe vedca - organizované pre žiakov 5. ročníka ZŠ Pavla Mercelyho, Drieňová, Bratislava	ÚPo SAV	5.04.2017
Mgr. Katarína Mosnáčková, PhD.		EX	Nájdi v sebe vedca - organizované pre žiakov 5. ročníka ZŠ	ÚPo SAV	4.05.2017

			Pavla Mercelyho, Drieňová, Bratislava		
Mgr. Veronika Némethová		IN	Egy ebéddel indult	http://www.ujno.sk/egy-ebeddel-indult	2017
Mgr. Veronika Némethová		TL	Egy ebéddel indult	Új Nő 2/2017 str. 20	2017
Mgr. Veronika Némethová		TL	Rozhovor s Top študentskou osobnosťou Slovenska „Ako pomôcť školstvu. Nepodceňovať študenta“	Denník Pravda	8.03.2017
Mgr. Veronika Némethová		IN	Rozhovor s Top študentskou osobnosťou Slovenska „Ako pomôcť školstvu. Nepodceňovať študenta“	https://zurnal.pravda.sk/rozhovory/clanok/422245-ako-pomoct-skolstvu-nepodcenovat-studentov/	8.03.2017
Ing. Mária Omastová, DrSc.		PB	Načo sú nám polyméry a prečo z nich robíme (nano)kompozity	Európska noc výskumníkov – 11. ročník, stánok ÚPo SAV pre verejnosť, Stará tržnica	29.09.2017
Ing. Mária Omastová, DrSc.		RO	Odpad ohrozuje aj naše rieky	Radio Regina	17.10.2017
Ing. Mária Omastová, DrSc.		TV	Pozrime sa na to – „Vedec roka 2016“	TA3:	16.5.2017
Ing. Mária Omastová, DrSc.		TV	VAT špeciál Vedec roka	SRTV 2	20.05.2017
Ing. Mária Omastová, DrSc.		RO	Vedkyňa Mária Omastová v Nočnej pyramíde	Radio Slovensko	10.08.2017
Ing. Mária Omastová, DrSc.		TL	Vedkyňa roka: Mladá generácia vie, že lacnejšie nie je vždy aj najlepšie	Denník Sme	27.09.2017
Ing. Mária Omastová, DrSc.	Chodák Ivan	TL	Chemicka-a-vedkyna-roka-v-nasich-riekach-je-viac-odpadu-ako-v-okolitych-krajinach/	Denník N	31.10.2017
Mgr. Silvia Podhradská, PhD.		PB	Dokážeme kopírovať prírodu?	Európska noc výskumníkov – 11. ročník, stánok ÚPo SAV pre verejnosť, Stará tržnica	29.09.2017
Mgr. Silvia Podhradská, PhD.		PB	Organizácia návštev	Deň otvorených dverí, ÚPo SAV	9.11.2017
Mgr. Silvia Podhradská, PhD.		EX	Organizácia návštev	Deň otvorených dverí, ÚPo SAV	9.11.2017
RNDr. Michal Procházka, PhD.		PB	„Roadshow“ mladých vedcov po školách	Gymnázium Ľudovíta Štúra vo Zvolene, Gymnázium a Stredná odborná škola v Krupine, Stredná lesnícka škola v	18.10.2017

				Banskej Štiavnici	
RNDr. Michal Procházka, PhD.		RO	„Roadshow“ mladých vedcov po školách	Rádio Regina, Rádio Express	2017
RNDr. Michal Procházka, PhD.		TV	„Roadshow“ mladých vedcov po školách	Televízna stanica STV 2; Správy RTVS z regiónov	25.10.2017
Ing. Lucia Rišpanová		PB	Teoretická chémia	Deň otvorených dverí, ÚPo SAV	10.11.2017
Ing. Lucia Rišpanová		EX	Teoretická chémia	Deň otvorených dverí, ÚPo SAV	10.11.2017
Mgr. Maroš Smolíček		PB	Nájdi v sebe vedca - organizované pre žiakov 5. ročníka ZŠ Pavla Mercelyho, Drieňová, Bratislava	ÚPo SAV	17.11.2017
Mgr. Maroš Smolíček		EX	Nájdi v sebe vedca - organizované pre žiakov 5. ročníka ZŠ Pavla Mercelyho, Drieňová, Bratislava	ÚPo SAV	17.11.2017
Ing. Alena Šišková, PhD.		PB	Dokážeme kopírovať prírodu?	Európska noc výskumníka – 11. ročník, stánok ÚPo SAV pre verejnosť, Stará tržnica	29.09.2017
Ing. Alena Šišková, PhD.		PB	Nájdi v sebe vedca - organizované pre žiakov 5. ročníka ZŠ Pavla Mercelyho, Drieňová, Bratislava	ÚPo SAV	5.04.2017
Ing. Alena Šišková, PhD.		EX	Nájdi v sebe vedca - organizované pre žiakov 5. ročníka ZŠ Pavla Mercelyho, Drieňová, Bratislava	ÚPo SAV	4.05.2017
Ing. Alena Šišková, PhD.		EX	organizácia	Deň otvorených dverí, ÚPo SAV	9.11.2017
Mgr. Zdenko Špitálsky, PhD.	Marković Zoran Kováčová Mária	TV	SAV má nový patent	Hlavné správy RTVS	12.03.2017
Mgr. Petra Šrámková, PhD.		PB	Úvodná prednáška	Deň otvorených dverí, ÚPo SAV	9.11.2017
Mgr. Anna Zahoranová, PhD.		PB	Nájdi v sebe vedca - organizované pre žiakov 5. ročníka ZŠ Pavla Mercelyho, Drieňová, Bratislava	ÚPo SAV	5.04.2017
Mgr. Anna Zahoranová, PhD.		EX	Nájdi v sebe vedca - organizované pre žiakov 5. ročníka ZŠ Pavla Mercelyho, Drieňová, Bratislava	ÚPo SAV	4.05.2017
Mgr. Anna Zahoranová, PhD.		EX	Ohybnosť plastov.	Deň otvorených dverí, ÚPo SAV	9.11.2017
Mgr. Anna Zahoranová, PhD.	Smolíček Maroš	PB	Dokážeme kopírovať prírodu?	Európska noc výskumníka – 11. ročník, stánok ÚPo SAV pre verejnosť,	29.09.2017

				Stará tržnica	
Mgr. Anna Zahoranová, PhD.	Smolíček Maroš	EX	Dokážeme kopírovať prírodu?	Európska noc výskumníka – 11. ročník, stánok ÚPo SAV pre verejnosť, Stará tržnica	29.09.2017
Mgr. Anna Zahoranová, PhD.	Smolíček Maroš	PB	Ohybnosť plastov.	Deň otvorených dverí, ÚPo SAV	9.11.2017
Ing. Mária Omastová, DrSc.		TL	Na vlnách histórie: Pocta akademikovi Ottovi Wichterlemu	In: ChemZi: Slovenský časopis o chémii pre chemické vzdelávanie, výskum a priemysel, 2017, roč. 13, č. 1, s. 12-13	1
Ing. Mária Omastová, DrSc.		TL	Predsedníctvo SAV v období 2017 až 2021 povedie Pavol Šajgalík.	In: ChemZi: Slovenský časopis o chémii pre chemické vzdelávanie, výskum a priemysel, 2017, roč. 13, č. 1, s. 16-17	1
Ing. Alena Šišková, PhD.	Podhradská Silvia	TL	7. ročník medzinárodnej konferencie BYPoS pre mladých polymérnych vedcov	CHemZi, Slovenský časopis o chémii, roč. 13, č. 1, str. 21	1
Mgr. Zdenko Špitálsky, PhD.	Marković Zoran Kováčová Mária	TL	Liečba svetlom.	Quark, 2017, roč. 23, č. 9, s. 12-13. ISSN 1337-8422.	12
Mgr. Zdenko Špitálsky, PhD.	Marković Zoran Kováčová Mária	TL	Nové antibakteriálne materiály s regulovateľným antibakteriálnym účinkom.	Prešporský podnikateľ: mesačník Bratislavskej regionálnej komory SOPK, 2017, roč. X, č. 4, s. 5. ISSN 1337-8295	12
Mgr. Zdenko Špitálsky, PhD.	Nógellová Zuzana Malíková Marta Janigová Ivica Žigo Ondrej Kováčová Mária Sobolčiak Patrik Krupa Igor	TL	Pozitívny vplyv expandovaného grafitu na fyzikálne správanie materiálov s fázovou premenou na báze polyetylénu s parafínovým voskom.	TechCON magazín: odborný časopis pre projektantov a odbornú verejnosť v oblasti TZB, užívateľov projekčného programu TechCON, 2017, roč.13, č. 1, s. 1	1

[1] *PB - prednáška/beseda, TL - tlač, TV - televízia, RO - rozhlas, IN - internet, EX - exkurzia, PU - publikácia, MM - multimédiá, DO - dokumentárny film*