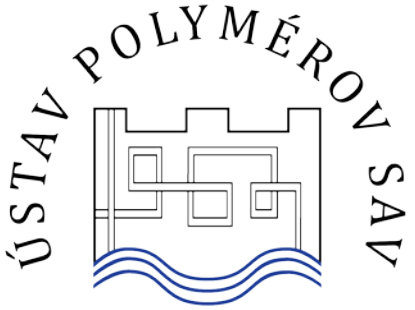
ÚSTAV POLYMÉROV SAV, BRATISLAVA



SPRÁVA O ČINNOSTI ZA ROK 2016

Bratislava, január 2017

Obsah Správy o činnosti organizácie SAV za rok 2016

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: RNDr. Peter Cifra, DrSc.
Adresa: Dúbravská cesta 9, 845 41 Bratislava 45
http://www.polymer.sav.sk
Tel.: 02/3229 4307
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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	84	31	53	7	21	78	63,32	48,52
Vedeckí pracovníci	42	21	21	2	11	36	34,48	34,48
Odborní pracovníci VŠ (výskumní a vývojoví zamestnanci[1])	26	7	19	5	10	26	14,24	14,04
Odborní pracovníci VŠ (ostatní zamestnanci[2])	1	0	1	0	0	1	1	0
Odborní pracovníci ÚS	11	1	10	0	0	11	10,8	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 31.12.2016 (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 31.12.2016 (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 31.12.2016)

Rodová skladba	Pracovníci s hodnosťou				Vedeckí pracovníci v stupňoch		
	DrSc.	CSc./PhD.	prof.	Doc.	I.	II.a.	II.b.
Muži	8	14	2	0	8	8	5
Ženy	1	20	0	0	1	4	16

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	6	1	5	4	1	1	0	4	4
Ženy	11	9	4	0	1	1	4	4	1

Tabuľka 1d Priemerný vek zamestnancov organizácie k 31.12.2016

	Kmeňoví zamestnanci		Vedeckí pracovníci		Riešitelia projektov	
	Bez úväzku	S úväzkom	Bez úväzku	S úväzkom	Bez úväzku	S úväzkom
Muži	47,0	37,5	49,2	45,3	45,5	38,9
Ženy	42,5	37,2	36,2	33,4	40,2	32,7
Spolu	44,2	37,3	42,7	39,3	42,5	35,3

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 2016 významne ovplyvnený akreditáciou, pričom podklady sa začali pripravovať už začiatkom roku a akreditácia vyvrcholila v novembri, kedy ústav navštívila akreditačná komisia. 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 nezávisle zhodnotenia na medzinárodnej úrovni. Výsledky akreditácie budú oznámené začiatkom roka 2017.

V roku 2016 sa Ústav polymérov SAV opäť podieľal na príprave niekoľkých projektov v rámci Horizont 2020, avšak zatiaľ žiaden z nich nebol podporený pre financovanie. Tieto projekty všeobecne predstavujú kvalitatívny rast pre zúčastnených vedeckých pracovníkov a doktorandov a tiež prispievajú k ekonomickej situácii ústavu. Preto i v roku 2017 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 3 projekty štrukturálnych fondov a v novembri bolo podaných celkovo 7 APVV projektov (z toho v 1 je ÚPo SAV nositeľom projektu a v 6 sa zmluvne podieľa na riešení projektu), ktoré budú vyhodnotené v prvej polovici roku 2017. Vedeckí pracovníci ÚPo riešili dva projekty spolupráce SAV s Tureckom, resp. Taiwanom, 1 ERA.NET projekt a 5 COST projektov ale i významné medinárodné projekty ako sú The Chicago Diabetes Project, Juvenile Diabetes Research Foundation projekt a kontrakt s firmou BASF.

V rámci snahy o zefektívnenia vedeckej ale i vzdelávacej spolupráce so slovenskými univerzitami sa uskutočnila prezentácia nových trendov v polymérnej chémii a syntetických tém riešených na ÚPo SAV študentom chémie na Prírodovedeckej fakulte UK v období rozhodovania sa o výbere témy ich bakalárskej práce. Aj vďaka takýmto aktivitám vedecký pracovníci ÚPo SAV viedli tri magisterské (jedna z nich bola ocenená cenou rektora STU) a tri bakalárske práce. Na ústave taktiež pôsobila jedna študentka so slovenskej VŠ a jedna študentka z českej VŠ ako vedecké pomocné sily, jedna vysokoškoláčka z Poľska cez ERASMUS a dvaja stredoškolskí študenti v rámci SOČ 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 2016 sa na ÚPo SAV taktiež rozšírila základňa doktorov vied, tentokrát z mladších kolegov, keďže DrSc. Prácu obhájil Mgr. Jaroslav Mosnáček, PhD.

2. Vedecká činnosť

2.1. Domáce projekty

Tabuľka 2a Počet domácich projektov riešených v roku 2016

ŠTRUKTÚRA PROJEKTOV	Počet projektov		Čerpané financie za rok 2016 (v €)		
			A		B
	A	B	spolu	pre organi-záciu	
1. Vedecké projekty, ktoré boli r. 2016 financované VEGA	19	1	119932	-	-
2. Projekty, ktoré boli r. 2016 financované APVV	8	11	217151	-	84790
3. Projekty OP ŠF	0	0	-	-	-
4. Projekty centier excelentnosti SAV	0	0	-	-	-
5. 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 Zoznam domácich projektov podaných v roku 2016

Štruktúra projektov	Miesto podania	Organizácia je nositeľom projektu	Organizácia sa zmluvne podieľa na riešení projektu
1. Účasť na nových výzvach APVV r. 2016	-	**1**	**6**
2. Projekty výziev OP ŠF podané r. 2016	Bratislava	**0**	**3**
	Regióny		

2.2. Medzinárodné projekty

2.2.1. Medzinárodné projekty riešené v roku 2016

Tabuľka 2c Zoznam medzinárodných projektov riešených v roku 2016

ŠTRUKTÚRA PROJEKTOV	Počet projektov		Čerpané financie za rok 2016 (v €)		
	A	B	A		B
			spolu	pre organi-záciu	
1. Projekty 7. Rámcového programu EÚ a Horizont 2020	3	0	188489	-	-
2. Multilaterálne projekty v rámci vedeckých programov COST, ERANET, INTAS, EUREKA, ESPRIT, PHARE, NATO, UNESCO, CERN, IAEA, ESF (European Science Foundation), ERDF a iné	1	11	34000	-	24996
3. Projekty v rámci medzivládnych dohôd o vedecko-technickej spolupráci	0	0	-	-	-
4. Bilaterálne projekty	10	3	2350	-	-
5. Podpora medzinárodnej spolupráce z národných zdrojov (MVTS, APVV,...)	2	7	64960	-	19042
6. Iné projekty financované alebo spolufinancované zo zahraničných zdrojov	1	1	-	-	70597

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

2.2.2. Medzinárodné projekty v 7. RP EÚ a Horizont 2020 podané v roku 2016

Tabuľka 2d Počet projektov 7. RP EÚ a Horizont 2020 v roku 2016

	A	B
Počet podaných projektov v 7. RP EÚ		
Počet podaných projektov Horizont 2020	**0**	**4**

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

2.3. Najvýznamnejšie výsledky vedeckej práce (maximálne 1000 znakov + 1 obrázok)

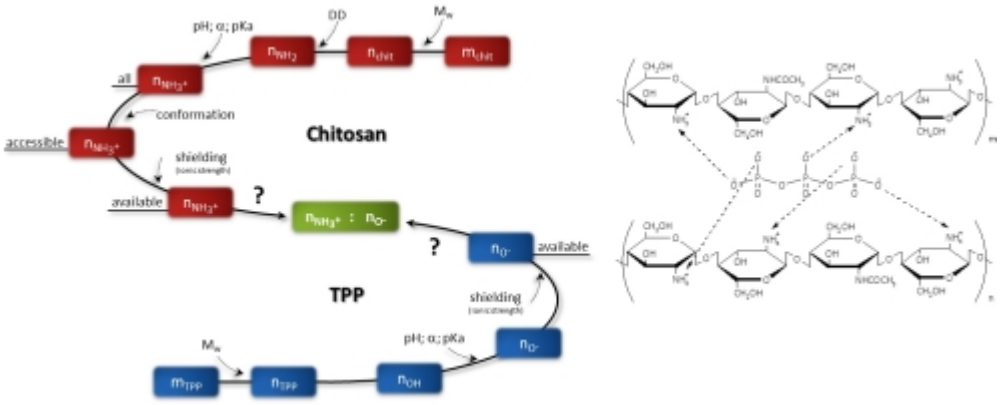
2.3.1. Základný výskum

1) Názov: **<u>Polyméry pre protinádorovú terapiu</u>.**

Ústav polymérov SAV

Mená riešiteľov: F. Rázga, V. Némethová, L. Kleščíková, P. Mazancová, R. Baran, P. Šrámková, A. Zahoranová, I. Lacík

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



Factors influencing the stoichiometry controlling the TPP-mediated ionic crosslinking of chitosan depending on the experimental conditions. The question mark denotes the uncertain impact of persistent length of polymer chains, critical overlap concentration, hydrodynamic interactions, counterion condensation and intra- and inter-molecular H-bonds, etc.

V hodnotiacom období sme významným spôsobom vstúpili do všetkých vedných oblastí novotvoriacej sa nosnej témy oddelenia, ktorá kombinuje expertízu polymérnej chémie, organickej chémie, molekulárnej biológie, hematológie a onkológie. Najzásadnejším výstupom pre tento rok je podanie medzinárodnej PCT prihlášky pokrývajúcej inovatívny koncept terapie pre chronickú myeloidnú leukémiu (CML), ktorý je *de novo* vyvíjaný na oddelení. Riešenie tohto projektu prinieslo v hodnotiacom období posun v syntéze prototypu a navyše sa vstúpilo do *in vitro* validácie jeho prekurzorov. Nakoľko tento projekt je riešený s kuratívnym zámerom, opiera sa o detailné poznanie mechanizmov účinku súčasných liečebných stratégií, ktoré zlyhávajú v eradikácii zdrojových nádorových buniek. Z tohto pohľadu je identifikácia leukemických kmeňových buniek nutná prerekvizita k liečbe CML. V spolupráci s FN Brno a MU Vienna sa nám v hodnotiacom období podarilo identifikovať a validovať fenotyp leukemickej kmeňovej bunky CML, čo predstavuje dáta svetového významu nielen z diagnostického pohľadu, ale predovšetkým z terapeutického. Na základe fenotypu sa totiž otvára cesta aktívneho cielenia tejto zdrojovej populácie CML buniek. Za týmto účelom na našom oddelení vyvíjame liekový nosič na báze biodegradovateľného chitozánu. Táto tematika však nie je ani zďaleka triviálna tak, ako sa prezentuje v literatúre. Z tohto dôvodu medzi ďalší významný výstup nášho oddelenia považujeme publikácie adresované chitozánovej komunite, ktoré kriticky a na základe rozsiahleho súboru dát zhodnocujú súčasné problémy, ktoré túto tematiku sužujú a v tejto komunite nie sú adekvátne diskutované. S ohľadom na zásadné medzery v poznaní, syntéza liekového nosiča na báze chitozánu nie je sfinalizovaná. Zároveň sme komunite, ktorá sa venuje aplikáciam nanosystémov pre biomedicínske účely sme odkomunikovali formou originálnych dát principiálne chyby pri charakterizácii nanočastíc a interpretácii ich využitia v biomedicínskych aplikáciách. V kontexte

kvantifikácie internalizácie nanočastíc sme postulovali nový prístup zohľadňujúci a kombinujúci výsledky DLS a AAS meraní. Paralelne sme otvorili otázku biobezpečnosti, čo pokladáme za vysoko hodnotnú informáciu s ohľadom na charakter potenciálnej aplikácie nanosystémov v klinickej praxi. V tejto súvislosti sme preukázali významný toxický efekt aj mininálneho množstva internalizovaných nanočastíc *in vitro*. Nakoľko je biologicky aktívna intracelulárna koncentrácia zásadným parametrom pre biologický účinok, v kontexte CML resp. hemato-onkologických ochorení sme vstúpili do témy transportných mechanizmov liečiv. Súčasná literatúra je nekonzistentná v interpretácii predikčného potenciálu týchto transportérov v zmysle liečebnej odpovede, preto sme odkomunikovali možné aspekty, ktoré sú dlhodobo podceňované a z nášho pohľadu stoja za generovaním diskrepantných dát.
Predmetný súbor publikovaných prác (celkový IF >40) predstavuje dobrú východiskovú pozíciu pre ukotvenie riešených tém nášho oddelenia v medzinárodnom kontexte.

Výstupy:

1. NÉMETHOVÁ, Veronika – RÁZGA, Filip. Overexpression of *ABCB1* as predicition marker for CML: How close we are to translation into clinics? *Leukemia*. 2016; doi:10.1038/leu.2016.266, (12.004 - IF2015).
2. RÁZGA, Filip – NÉMETHOVÁ, Veronika. Gene expression patterns as predictive biomarkers in hemato-oncology: Principal hurdles on the road to the clinic. *Haematologica*. 2016; accepted, (6.671 - IF2015).
3. MAZANCOVÁ, Petra – NÉMETHOVÁ, Veronika – LACÍK, Igor – RÁZGA, Filip. Chitosan-based particles: The (forgotten) interplay between process, properties and performance. *Mater Sci Eng C Mater Biol Appl*. 2016; doi: 10.1016/j.msec.2016.11.036, (3.420 - IF2015).
4. NÉMETHOVÁ, Veronika – BULIAKOVÁ, B. – MAZANCOVÁ, Petra – BÁBELOVÁ, A. – ŠELC, M. – MORAVČIKOVÁ, Daniela – KLEŠČÍKOVÁ, Lucia – URSÍNYOVÁ, M. – GÁBELOVÁ, A. – RÁZGA, Filip. Intracellular uptake of magnetite nanoparticles: a focus on physico-chemical characterization and interpretation of *in vitro* data. *Mater Sci Eng C Mater Biol Appl*. 2017; 70, 161-168, (3.420 - IF2015).
5. BULIAKOVÁ, B. – MESÁROŠOVÁ, M. – BÁBELOVÁ, A. – ŠELC, M. – NÉMETHOVÁ, Veronika – ŠEBOVÁ, L. – RÁZGA, Filip – URSÍNYOVÁ, M. – CHALUPA, I. – GÁBELOVA, A.* Surface-modified magnetite nanoparticles act as aneugen-like spindle poison. *Nanomedicine*. 2016; doi: 10.1016/j.nano.2016.08.027, (5.671 - IF2015).
6. RÁZGA, Filip - *VNUKOVÁ, Dominika* - NÉMETHOVÁ, Veronika - MAZANCOVÁ, Petra - LACÍK, Igor. Preparation of chitosan-TPP-sub-micron particles: Critical evaluation and derived recommendations. In *Carbohydrate Polymers*, 2016, vol. 151, p. 488-499. (4.219 - IF2015). ISSN 0144-8617. Typ: ADCA
7. RÁZGA, Filip – NÉMETHOVÁ, Veronika. A method for altering the functional state of any mRNA allowing its selective and specific recognition. PCT/SK2016/060002, podaná prihláška
8. ČULEN, M. - BORSKÝ, M. - NÉMETHOVÁ, Veronika - RÁZGA, Filip - SMEJKAL, J. - JURCEK, T. - DVORAKOVA, D. - ZACKOVA, D. - WEINBERGEROVA, B. - SEMERAD, L. - SADOVNIK, I. - EISENWORT, G. - HERRMANN, H. - VALENT, P. - MAYER, J. - RACIL, Z. Quantitative assessment of the CD26+ leukemic stem cell compartment in chronic myeloid leukemia: Patient-subgroups, prognostic impact, and technical aspects. In *Oncotarget*, 2016, vol. 7, no. 22, p. 33016-33024. (5.008 - IF2015). ISSN 1949-2553.Typ: ADMA

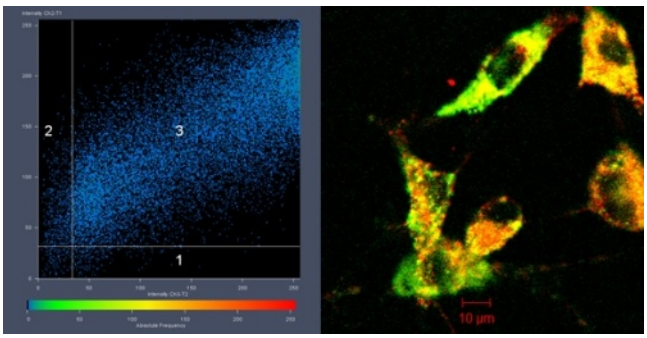
2) Názov: **Poly(2-izopropenyl-2-oxazolín) ako nový typ biomedicínskych polymérov.**
Poly(2-isopropenyl-2-oxazoline) as a new type of biomedical polymers.

Ústav polymérov SAV

Mená riešiteľov: J. Kronek, Z. Kroneková, N. Petrenčíková

Projekty v rámci ktorých sa výsledok dosiahol: VEGA 2/0163/15

Naše úsilie bolo zamerané na prípravu a štúdium vlastností poly(2-izopropenyl-2-oxazolínu) (PIPOx) predstavujúceho stavebný blok pre prípravu biokonjugátov, nanočastíc a hydrogélov. *In vitro* cytotoxicita bola sledovaná pomocou MTT testu, pričom sa potvrdila netoxickosť polyméru pri koncentráciách minimálne 10 mg/ml. *Ex vivo* proliferácia splenocytov izolovaných z myší potvrdila netoxickosť polyméru a poukázala na imunomodulačné vlastnosti, keď dochádzalo k proliferačnej aktivite v populácii makrofágov a dendritických buniek. Internalizácia PIPOx-u značeného pyrénovou fluorescenčnou značkou do myších makrofágov bola sledovaná pomocou kolokalizačných experimentov, ktoré potvrdili kolokalizáciu polymérov v lyzozómoch ako súčasť endozomálnej dráhy. PIPOx sa následne modifikoval naviazaním protizápalových liečiv. Pripravili sa konjugáty s aspirínom, indometacínom a ibuprofenom, pričom sa vo všetkých prípadoch potvrdilo zníženie toxického efektu konjugátov v porovnaní s voľnými liečivami.



Kolokalizácia poly(2-izopropenylu) v lyzozómoch myších fibroblastov zobrazená použitím konfokálnej laserovej mikroskopie, vľavo prekryv flurescenčnej značky z polymer s LysoTracker farbivom, vpravo snímka fibroblastov po internalizácií PIPOx-u.

Výstupy:

1. KRONEKOVÁ, Zuzana - *MIKULEC, Marcel* - PETRENČÍKOVÁ, Nadežda - PAULOVIČOVÁ, E. - PAULOVIČOVÁ, L. - JANČINOVÁ, V. - NOSÁĽ, R. - REDDY, P. S. - SHIMOGA, Ganesh D. - CHORVÁT, D. Jr. - KRONEK, Juraj. Ex vivo and in vivo studies on the cytotoxicity and immunomodulative properties of poly(2-isopropenyl-2-oxazoline) as a new type of biomedical polymer. In *Macromolecular Bioscience*, 2016, vol. 16, p. 1200-1211. (3.680 - IF2015). ISSN 1616-5187. Typ: ADCA
2. KRONEK, Juraj. Poly(2-oxazolines) as biomedical materials. In *Encyclopedia of Biomedical Polymers and Polymeric Biomaterials*. - New York, US : Taylor & Francis, 2015, p. 6031-6047. ISBN 978-1-439-89879-6. Typ: ABC
3. KRONEK, Juraj - KRONEKOVÁ, Zuzana - PETRENČÍKOVÁ, Nadežda - KLEINOVÁ, Angela - PAULOVIČOVÁ, E. - PAULOVIČOVÁ, L. Poly(2-isopropenyl-2-oxazoline) as a functional polymer for biomedical application. In *BIMac 2016 : XXII. Bratislava Conference on Macromolecules : Polymers with Tailored Architecture and Properties : programme book and book of abstracts*. - Bratislava : Ústav polymérov SAV, 2016, p. 27. ISBN 978-80-89841-01-1. Typ: AFH

3) Názov: Analýza linearizácie cyklických a lineárnych makromolekúl v kanáloch s asymetrickým prierezom.
Analysis of linearization of cyclic and linear macromolecules in channels of asymmetric cross-section

Ústav polymérov SAV

Mená riešiteľov: P. Cifra, Z. Benková, P. Námer

Projekty v rámci ktorých sa výsledok dosiahol: APVV-15-0323, VEGA 2/0055/16, VEGA 2/0098/16

Z výsledkov molekulových simulácií sa uskutočnila analýza správania sa cyklického reťazca v kanáli s rôznym prierezom. Prierez kanála sa menil od trojrozmernej geometrie po kvázi dvojrozmernú geometriu, pri ktorej výška kanála zodpovedala rozmerom jedného monoméru. Z experimentálneho hľadiska je v takomto kanáli jednoduchšie analyzovať linearizáciu polymérneho reťazca, keďže tu klesá počet konformačných režimov reťazca oproti situácii v trojrozmernom kanáli a tiež dochádza ku výraznejšiemu natiahnutiu reťazca, čo má význam pri jednomolekulových experimentoch v nanofluidných zariadeniach. Situácia pre cyklický reťazec sa porovnala so situáciou pre lineárny reťazec. V dôsledku zvýšeného vylúčeného objemu stesnaného cyklického reťazca je možné použiť aj dostatočne nízke a experimentálne dostupné kanály, v ktorých sú zachované výhody kvázi dvojrozmernej geometrie. Dosiahnutie tohto efektu pre lineárny reťazec si vyžaduje podstatne nižší kanál. Bol podrobne popísaný štruktúrny faktor reťazcov a navrhnutý na identifikovanie režimu správania v kanálmi obmedzovaných makromolekulách bez toho, aby bolo potrebné uskutočňovať experimentálne merania v celej sérii rôzne vysokých a širokých kanálov.

Výstupy:

1. BENKOVÁ, Zuzana - NÁMER, Pavol - CIFRA, Peter. Comparison of a stripe and slab confinement for ring and linear macromolecules in nanochannel. In *Soft Matter*, 2016, vol. 12, p. 8425-8439. (3.798 - IF2015). ISSN 1744-683X. Typ: ADCA

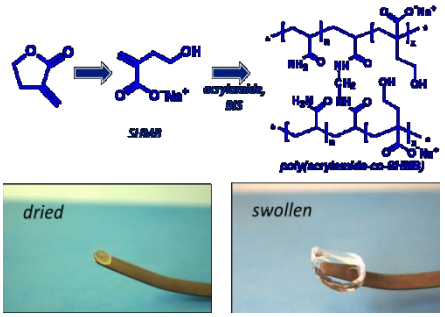
2.3.2. Aplikačný typ

1) Názov: Tulipalin A – monomér pre prípravu hydrogélov.
Tulipalin A – monomer for preparation of hydrogels.

Ústav polymérov SAV

Mená riešiteľov: J. Kollár, D. Moravčíková, J. Mosnáček

Projekty v rámci ktorých sa výsledok dosiahol: VEGA 2/0167/14, SAS-MAS bilaterálny projekt „Bio-friendly multifunctional polymers“, ERDF projekt POLYFRIEND (č. projektu HUSK 1101/1.2.1/0209)



***Obrázok**: Syntéza superabsorbčných hydrogélov na báze Tulipalínu A a fotografie suchého a napučaného hydrogélu.*

Monomér z obnoviteľných zdrojov α-metylén-γ-butyrolaktón, známy tiež ako Tulipalin A sa použil pri kopolymerizácii s akrylamidom, pričom vzniknuté hydrogély predstavujú polymérny materiál so superabsorpčnými vlastnosťami. Schopnosť napučiavať v destilovanej vode (13-820 násobný nárast hmotnosti) je ovplyvnená pomerom komonomérov ako aj stupňom presietenia. V porovnaní s komerčne dostupnými polymérmi na báze akrylamid/kyselina akrylová, má polymér obsahujúci hydrolyzovaný Tulipalin A významne vyššiu kapacitu viazania vody. Pomer komonomérov a stupeň presietenia má tiež významný vplyv na viskoelastické charakteristiky hydrogélov. Štúdium cytotoxicity spomínaných materiálov preukázalo ich nezávadnosť, čo umožňuje použitie v širokej škále aplikácií od pôdohospodárstva, hygienické potreby až po biomedicínu.

Výstupy:

1. KOLLÁR, Jozef - MRLÍK, M. - MORAVČÍKOVÁ, Daniela - KRONEKOVÁ, Zuzana - LIPTAJ, T. - LACÍK, Igor - MOSNÁČEK, Jaroslav. Tulips: A renewable source of monomer for superabsorbent hydrogels. In *Macromolecules*, 2016, vol. 49, p. 4047-4056. (5.554 - IF2015). ISSN 0024-9297. Typ: ADCA

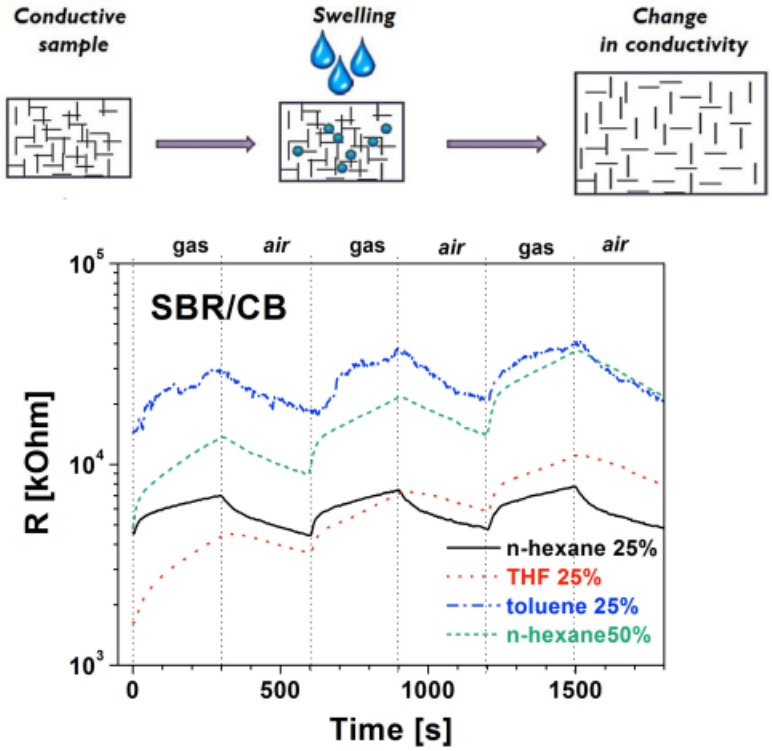
1. **Názov: <u>Senzory plynov na báze styrén-butadiénových kaučukov a uhlíkových plnív,</u>**
   Styrene butadiene rubber/carbon filler-based vapor sensors.

Ústav polymérov SAV

Mená riešiteľov: M. Mičušík, J. Tabačiarová, M. Omastová

Projekty v rámci ktorých sa výsledok dosiahol: VEGA 2/0149/14, APVV-0593-11 a Slovensko-Nemecký projekt DAAD (PPP Slowakei, 2013–2014)

Boli pripravené dva typy kompozitov na báze styrén-butadiénového kaučuku (SBR) plneného uhlíkovými nanotrubičkami (CNT) a sadzami (CB). Podrobne sa preštudovala ich morfológia a elektrická vodivosť. Porovnali sa senzorické odozvy na prítomnosť pár rôznych rozpúšťadiel (Obr. 1). Zosieťované kompozity obsahovali rôznu koncentráciu plniva. Pomocou dielektrickej relaxačnej spektroskopie sa stanovila elektrická perkolácia pre oba typy kompozitov, pretože kompozity tesne nad perkoláciou sú najvhodnejšie na senzorické odozvy. Na základe napučiavacich experimentov s viacerými rozpúšťadlami sa vybrali tri: toluén, tetrahydrofurán a n-hexán. Testovala sa senzorická odozva na prítomnosť pár týchto rozpúšťadiel v rôznej koncentrácii. Pozorovali sa veľmi intenzívne a rýchle odozvy, v niektorých prípadoch odozvy dosahovali limit našej prístrojovej zostavy (príliš vysoké odpory). SBR/CB kompozity reagovali oveľa rýchlejšie v prípade všetkých troch plynov vporovnaní s SBR/CNT kompozitmi.



Obrázok 1. Senzorické odozvy SBR/CB kompozitu.

Výstupy:

1. *<u>TABAČIAROVÁ, Jana - KRAJČI, Juraj</u>* - PIONTECK, J. - REUTER, U. - <u>OMASTOVÁ, Mária – MIČUŠÍK, Matej</u>. Styrene butadiene rubber/carbon filler-based vapor sensors. In *Macromolecular Chemistry and Physics*. 2016, vol. 217, p. 1149−1160. Typ: ADCA

3) Názov: Štúdium stárnutia mäkčených PLA/PHB zmesí počas UV ožarovania a aplikácie v reálnych pôdnych podmienkach ako mulčovacej fólie.

Study of PLA-PHB blends ageing during UV irradiation and aplication as mulching foils in real agricultural conditions.

Ústav polymérov SAV

Mená riešiteľov: K. Mosnáčková, Š. Chmela, J. Rychlý, M. Danko, K. Czaniková-Forró, I. Lacík, J. Kollár, D. Moravčíková, L. Falco, J. Mosnáček

Projekty v rámci ktorých sa výsledok dosiahol: VEGA 2/0167/14, ERDF projekt POLYFRIEND - HUSK/1101/1.2.1/0209

Pripravili sa mäkčené polymérne zmesi na báze polymliečnej kyseliny a poly(β-hydroxybutyrát) za účelom ich testovania v reálnych pôdnych podmienkach pre aplikácie v poľnohospodárstve. Štúdia bola zameraná na zmenu mechanických vlastností počas biodegradácie v pôde a vplyvom UV ožarovania v laboratórnych podmienkach počas jednej sezóny použitia ako mulčovacej fólie. Transparentné polymérne zmesi sa použili pri výsadbe paprík v spolupráci so Slovenskou poľnohospodárskou univerzitou v Nitre. Bolo preukázané, že testované fólie boli po jednej sezóne použitia stále kompaktné napriek výraznej strate mechanických vlastností v dôsledku fyzikálneho stárnutia a sekundárnej kryštalizácie vplyvom poveternostných podmienok a pôdnej mikroflóry. Dopestované plodiny mali v porovnaní s nemulčovanými výšši obsah karotenoidov. Bol taktiež pozorovaný celkový nárast úrody s 20 % prírastkom hmotnosti dopestovaných plodín v dôsledku vyššej teploty a vlhkosti pôdy počas vegetačného obdobia.

Výstupy:

1. MOSNÁČKOVÁ, Katarína - ŠIŠKOVÁ, Alena - JANIGOVÁ, Ivica - KOLLÁR, Jozef - ŠLOSÁR, M. - CHMELA, Štefan - ALEXY, P. - CHODÁK, Ivan - BOČKAJ, J. - MOSNÁČEK, Jaroslav. Ageing of plasticized poly(lactic acid)/poly(beta/hydroxybutyrate) blend films under artificial UV irradiation and under real agricultural conditions during their application as mulches. In Chemical Papers, 2016, vol. 70, no. 9, p. 1268-1278. (1.326 - IF2015). ISSN 0366-6352. Typ: ADDA
2. MOSNÁČKOVÁ, Katarína - ŠIŠKOVÁ, Alena - JANIGOVÁ, Ivica - DANKO, Martin - CHMELA, Štefan - ALEXY, P. - CHODÁK, Ivan - MOSNÁČEK, Jaroslav. Degradation behaviour of poly(lactic acid)/poly(3-hydroxybutyrate) blends and carbon black composites in soil conditions and after UV irradiation. In Brochure of ABIOG Partners : 2th Meeting of ABIOG Project Managements Committee & Workshop. - Bratislava, Slovak Republic : Polymer Institute of SAS, 2016, p. 18. ISBN 978-80-89841-02-8. Typ: AFH

2.3.3. Medzinárodné vedecké projekty

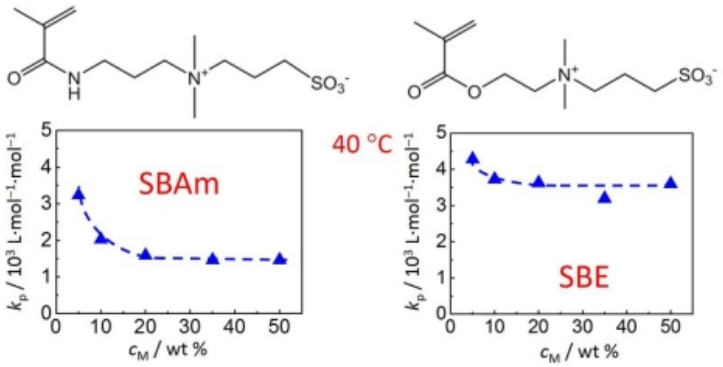
1) Názov: Kinetika a mechanizmus radikálovej polymerizácie vo vodnom prostredí.
Kinetics and mechanism of radical polymerization in aqueous environment.

Ústav polymérov SAV

Mená riešiteľov: I. Lacík, A. Chovancová, E. Hipká

Projekty v rámci ktorých sa výsledok dosiahol: BASF projekt, VEGA 2/0198/14

Ústav polymérov SAV má významné postavenie vo svete v tematike polymerizácie vo vodnej faze. Naša expertíza je dokumentovaná pobytmi zahraničných študentov cez SAIA štipendium a cez iné zdroje na našom pracovisku ako aj kontrakt s BASF SE v Ludwigshafene do roku 2018. Pre homopolymerizácie neionizovanej kyseliny akrylovej a akrylamidu sú k dispozícii všetky individuálne rýchlostné konštanty radikálovej polymerizácie, mechanizmus polymerizácie a vplyv prenosu na polymér, na základe čoho bolo možné tieto systémy úspešne modelovať. Zovšeobecnili sme tzv. solvent efekt pre radikálovú polymerizáciu neionizovaných monomérov vo vodnej faze. Získali sme prvé vôbec rýchlostné konštanty pre radikálovú polymerizáciu zwitterionových monomérov vo vodnej faze, kde sme identifikovali hybridné správanie závislosti rýchlostnej konštanty propagácie od koncentrácie monoméru medzi neionizovanými a ionizovanými monomérmi. Určili sme nestacionárne procesy v pulznej laserovej polymerizácii numerickými prístupmi vzhľadom na teplotné gradienty počas polymerizácie, čo značne zvyšuje presnosť stanovenia rýchlsotných konštánt propagácie.



Hybridná závislosť rýchlosti propagácie od koncentrácie monoméru pre sulfobetaínové monoméry

Výstupy:

1. LACÍK, Igor - *SOBOLČIAK, Patrik - STACH, Marek* - CHORVÁT, D. Jr. - *KASÁK, Peter*. Propagation rate coefficient for sulfobetaine monomers by PLP-SEC. In *Polymer : the International Journal for the Science and Technology of Polymers*, 2016, vol. 87, p. 38-49. (3.586 - IF2015). ISSN 0032-3861. Typ: ADCA
2. LACÍK, Igor - CHOVANCOVÁ, Anna - UHELSKÁ, Lucia - PREUSSER, C. - HUTCHINSON, R. A. - BUBACK, M. PLP-SEC studies into the propagation rate coefficient of acrylamide radical polymerization in aqueous solution. In *Macromolecules*, 2016, vol. 49, p. 3244-3253. (5.554 - IF2015). ISSN 0024-9297. Typ: ADCA
3. PALMIERO, U. C. - CHOVANCOVÁ, Anna - CUCCATO, D. - STORTI, G. - LACÍK, Igor- MOSCATELLI, D. The RAFT copolymerization of acrylic acid and acrylamide. In *Polymer : the International Journal for the Science and Technology of Polymers*, 2016, vol. 98, p. 156-164. (3.586 - IF2015). ISSN 0032-3861. Typ: ADCA
4. PREUSSER, C. - CHOVANCOVÁ, Anna - LACÍK, Igor - HUTCHINSON, R. A. Modeling the radical batch homopolymerization of acrylamide in aqueous solution. In *Macromolecular Reaction Engineering*, 2016, vol. 10, p. 490-501. (1.256 - IF2015). ISSN 1862-832X. Typ: ADCA
5. WITTENBERG, N. F. G. - PREUSSER, C. - KATTNER, H. - *STACH, Marek* - LACÍK, Igor - HUTCHINSON, R. A. - BUBACK, M. Modeling acrylic acid radical polymerization in aqueous solution. In *Macromolecular Reaction Engineering*, 2016, vol. 10, p. 95-107. (1.256 - IF2015). ISSN 1862-832X. Typ: ADCA

6. NIKITIN, A. N. - LACÍK, Igor - HUTCHINSON, R. A. A 3D simulation investigation of the influence of temperature increases on the accuracy of propagation rate coefficients determined by pulsed-laser polymerization. In *Macromolecules*, 2016, vol. 49, p. 9320-9335. (5.554 - IF2015). ISSN 0024-9297. Typ: ADCA

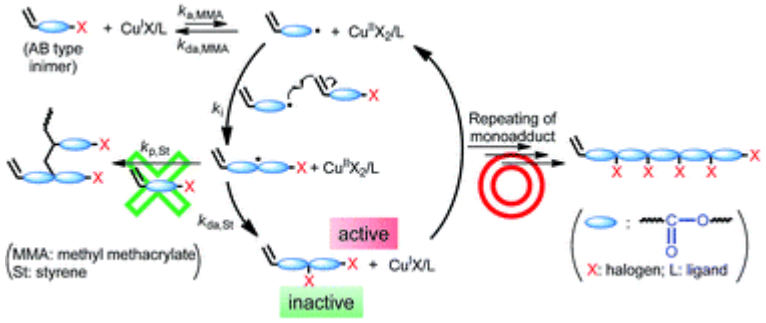
2) **Názov: Identifikácia kľúčových parametrov pri syntéze lineárnych polyesterov radikálovou polyadíciou s prenosom atómu.**
Identification of key parameters in synthesis of linear polyesters by atom transfer radical polyadition.

Ústav polymérov SAV

Mená riešiteľov: D. Moravčíková, J. Mosnáček

Projekty v rámci ktorých sa výsledok dosiahol: SAS-MOST JRP 2014-9

V spolupráci s Taiwanským partnerom sa vyvíjala radikálová polyadícia s prenosom atómu (ATRPA) štruktúrne rôznych inimérov. ATRPA predstavuje novú stratégiu v príprave lineárnych alifatických polyesterov. Sledoval sa vplyv kľúčových parametrov na priebeh polyadície (katalytický systém, ligand, typ a povrch Cu, rozpúšťadlo, teplota). Aktívnejšie ligandy aktivovali pôvodný aj novo-vytvorený alkylhalogenid, čím dochádzalo k vetveniu polyesteru. Výššia polarita rozpúšťadla viedla k vzniku viac degradačných produktov a vyššiemu stupňu vetvenia polyesteru. Na rýchlosť a priebeh polyadície mala veľký vplyv aj teplota. Pri 0°C bola polymerizácia príliš pomalá, pri 25°C bola rýchla. Najlepšie bežala polymerizácia pri 10 °C, pričom sa podarilo pripraviť lineárne hydrolyzovateľné polyméry s Mw do 16 000 g/mol obsahujúcimi množstvo funkčných skupín umožňujúcich následnú postfunkcionalizáciu.



Obrázok: *Syntéza polyesterov pomocou ATRPA inimérov*

Výstupy:

1. HUANG, Ch.-F. - KUO, S.-W. - MORAVČÍKOVÁ, Daniela - LIAO, J.-C. - HAN, Y.-M. - LEE, T.-Han - WANG, P.-H. - LEE, R.-H. - TSIANG, R. Ch.-Ch. - MOSNÁČEK, Jaroslav. Effect of variations of CuIIX2/L, surface area of Cu0, solvent, and temperature on atom transfer radical polyaddition of 4-vinylbenzyl 2-bromo-2-isobutyrate inimers. In *RSC Advances*, 2016, vol. 6, p. 51816-51822. (3.289 - IF2015). ISSN 2046-2069. Typ: ADCA

3) Názov: Multifunkčné materiály pre neurálne rozhrania.
Multifunctional materials for neural interfaces.

Ústav polymérov SAV, Scuola Superiora St. Anna, Pontedera, Taliansko, SMANIA, Pontedera, Taliansko

Mená riešiteľov: I. Lacík, J. Kronek, D. Treľová, P. Šrámková, A. Zahoranová, D. Hlásna

Projekty v rámci ktorých sa výsledok dosiahol: M.ERA-net M2Neural projekt

V rámci riešenia projektu M2Neural zameraného na vývoj novej generácie neurálnych elektród s obojsmerným prenosom informácií na rozhraní periférnej nervovej sústavy sa pripravil nový typ hydrogélových vrstiev kovalentne viazaných na polyimidový podklad. Dôvodom ich vývoja je nízka mechanická kompatibilita medzi trvdým polyimidovým povrchom, ktorý tvorí kostru súčasne používaných elektród a mäkkým neurálnym tkanivom. Na prípravu hydrogélových vrstiev boli použité kopolyméry obsahujúce biokompatibilnú poly(zwitteriónovú) zložku a fotocitlivú azidofenylovú jednotku schopnú poskytovať fotoindukované sieťovanie a očkovanie na rôzne polymérne povrchy. V závislosti od obsahu fotocitlivej zložky a koncentrácie vodného roztoku kopolyméru pri nanášaní sa pripravili stabilné hydrogélové vstvy s hrúbkou v rozpätí 5-10 mm a

Youngovym modulom pružnosti na úrovni neurálneho tkaniva. *In vitro* testy adhézie makrofágov a fibroblastov na povrch hydrogélov potvrdili nízku biozanášateľnosť povrchov.

Výstupy:

1. ŠRÁMKOVÁ, Petra - ZAHORANOVÁ, Anna - KRONEKOVÁ, Zuzana - KRONEK, Juraj. Poly(2-oxazoline) hydrogels by photoinduced thiol-ene click reaction using different dithiol crosslinkers. In BIMac 2016 : XXII. Bratislava Conference on Macromolecules : Polymers with Tailored Architecture and Properties : programme book and book of abstracts. Bratislava : Ústav polymérov SAV, 2016, p. 57. Typ: AFH
2. ŠRÁMKOVÁ, Petra - ŠIŠKOVÁ, Alena - KRONEK, Juraj. Thiol-ene click reaction as efficient method for preparation of cross-linked materials based on poly(2-oxazolines). In BYPOS 2016 : 6th Bratislava Young Polymer Scientists Workshop : March 13th-18th, 2016 : High Tatras, Slovakia : workshop book. - Bratislava : Young Scientists Council of Polymer Institute of SAS, 2016, p. 103. Typ: AFH

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

Tabuľka 2e Štatistika vybraných kategórií publikácií

PUBLIKAČNÁ A EDIČNÁ ČINNOSŤ	A Počet v r. 2016/ doplnky z r. 2015	B Počet v r. 2016/ doplnky z r. 2015	C Počet v r. 2016/ doplnky z r. 2015
1. Vedecké monografie a monografické štúdie vydané v domácich vydavateľstvách (AAB, ABB)	**0 / 0**	**0 / 0**	**0 / 0**
2. Vedecké monografie a monografické štúdie vydané v zahraničných vydavateľstvách (AAA, ABA)	**1 / 0**	**0 / 0**	**0 / 0**
3. Odborné monografie, vysokoškolské učebnice a učebné texty vydané v domácich vydavateľstvách (BAB, ACB, CAB)	**0 / 0**	**0 / 0**	**0 / 0**
4. Odborné monografie a vysokoškolské učebnice a učebné texty vydané v zahraničných vydavateľstvách (BAA, ACA, CAA)	**0 / 0**	**0 / 0**	**0 / 0**
5. Kapitoly vo vedeckých monografiách vydaných v domácich vydavateľstvách (ABD)	**0 / 0**	**0 / 0**	**0 / 0**
6. Kapitoly vo vedeckých monografiách vydaných v zahraničných vydavateľstvách (ABC)	**6 / 0**	**0 / 0**	**0 / 0**
7. Kapitoly v odborných monografiách, vysokoškolských učebniciach a učebných textoch vydaných v domácich vydavateľstvách (BBB, ACD)	**0 / 0**	**0 / 0**	**0 / 0**
8. Kapitoly v odborných monografiách, vysokoškolských učebniciach a učebných textoch vydaných v zahraničných vydavateľstvách (BBA, ACC)	**1 / 0**	**0 / 0**	**0 / 0**
9. Vedecké práce registrované v Current Contents Connect (ADCA, ADCB, ADDA, ADDB)	**67 / 0**	**0 / 0**	**5 / 0**
10. Vedecké práce registrované vo Web of Science Core Collection alebo Scopus (ADMA, ADMB, ADNA, ADNB)	**6 / 0**	**0 / 0**	**0 / 0**
11. Vedecké práce v ostatných domácich časopisoch (ADFA, ADFB)	**0 / 0**	**0 / 0**	**0 / 0**
12. Vedecké práce v ostatných zahraničných časopisoch (ADEA, ADEB)	**3 / 0**	**0 / 0**	**0 / 0**
13. Vedecké práce v domácich recenzovaných zborníkoch (AEDA)	**1 / 0**	**0 / 0**	**0 / 0**
14. Vedecké práce v zahraničných recenzovaných zborníkoch (AECA)	**5 / 0**	**0 / 0**	**0 / 0**
15. Publikované príspevky na domácich vedeckých konferenciách (AFB, AFD)	**2 / 1**	**0 / 0**	**0 / 0**
16. Publikované príspevky na zahraničných vedeckých konferenciách (AFA, AFC)	**13 / 0**	**0 / 0**	**0 / 0**
17. Vydané periodiká evidované v CCC, WoS Core Collection, SCOPUS	**0 / 0**	**0 / 0**	**0 / 0**

18. Ostatné vydané periodiká	**0 / 0**	**0 / 0**	**0 / 0**
19. Vydané alebo editované zborníky z vedeckých podujatí (FAI)	**3 / 0**	**2 / 0**	**0 / 0**
20. Preklady vedeckých a odborných textov (EAJ)	**0 / 0**	**0 / 0**	**0 / 0**
21. Heslá v odborných terminologických slovníkoch a encyklopédiách (BDA, BDB)	**0 / 0**	**0 / 0**	**0 / 0**

A - pracovisko SAV je uvedené ako pracovisko (adresa) autora, alebo je súčasťou kolaborácie alebo iného združenia, ktoré je uvedené ako pracovisko (adresa) autora
B - pracovisko SAV nie je na publikácii uvedené, pretože prameň údaj o pracovisku autora neobsahuje, práca ale vznikla na pracovisku SAV
C - pracovisko SAV je uvedené ako materské pracovisko autora odlišné od pracoviska, na ktorom práca vznikla (napr. „on leave...“, „permanent address...“, „present address...“)

Tabuľka 2f Štatistika vedeckých prác podľa kvartilu vedeckého časopisu

Kvartil vedeckého časopisu podľa IF z r. 2015 (zdroj JCR)	**Q1**	**Q2**	**Q3**	**Q4**	**spolu**
Počet článkov / doplnky	37/0	20/0	14/0	1/0	72/0
Kvartil vedeckého časopisu podľa SJR z r. 2015 (zdroj Scimago)					
Počet článkov	45	25	4	0	74

Tabuľka 2g Ohlasy

OHLASY	**A** **Počet v r. 2015/ doplnky z r. 2014**	**B** **Počet v r. 2015/ doplnky z r. 2014**
Citácie vo WOS (1.1, 2.1)	1606 / 3	4 / 0
Citácie v SCOPUS (1.2, 2.2)	164 / 3	0 / 0
Citácie v iných citačných indexoch a databázach (9, 10, 3.2, 4.2)	0 / 0	0 / 0
Citácie v publikáciách neregistrovaných v citačných indexoch (3, 4, 3.1, 4.1)	4 / 0	0 / 0
Recenzie na práce autorov z organizácie (5, 6, 7, 8)	0 / 0	0 / 0

A - pracovisko SAV je uvedené ako pracovisko (adresa) autora, alebo je súčasťou kolaborácie alebo iného združenia, ktoré je uvedené ako pracovisko (adresa) autora, alebo pracovisko SAV nie je na publikácii uvedené, pretože prameň údaj o pracovisku autora neobsahuje, práca ale vznikla na pracovisku SAV
B - pracovisko SAV je uvedené ako materské pracovisko autora odlišné od pracoviska, na ktorom práca vznikla (napr. „on leave...“, „permanent address...“, „present address...“)

2.5. Aktívna účasť na vedeckých podujatiach

Tabuľka 2h Vedecké podujatia

Prednášky a vývesky na medzinárodných vedeckých podujatiach	**78**
Prednášky a vývesky na domácich vedeckých podujatiach	**76**

2.6. Vyžiadané prednášky

2.6.1. Vyžiadané prednášky na medzinárodných vedeckých podujatiach

1. BENKOVÁ, Zuzana - NÁMER, Pavol - CIFRA, Peter. Linear and ring DNA in nanochannels under stripe and slab confinement, Polymers with spatial and mechanical constraints. Workshop, 7. -9.07. 2016, Benátky, Taliansko, bez zborníka, pozva ná prednáška PC

2. BENKOVÁ, Zuzana - NÁMER, Pavol - CIFRA, Peter. Simulation of linear and ring DNA in nanochannels, Dedicated paraallel machnines a breakthrough in computation ARUZ. Workshop 2016, 1. 12.-3, 12. 2016, Lodz, Poland, abstrakt v zborníku, p.21-22, ISBN 978-83-7283-792-9, pozvaná prednáška PC
3. KRONEK, Juraj – KRONEKOVÁ, Zuzana – ŠRÁMKOVÁ, Petra – ZAHORANOVÁ, Anna – PETRENČÍKOVÁ, Nadežda – MRLÍK, M. – MOSNÁČEK, Jaroslav. Functional polymers based on unsaturated 2-oxazolines:from thermosensitive polymers to hydrogels. In *ACS Symposium, August 21-26, 2016, Philadelphia.*
4. RAČKO, Dušan - BENEDETTI, F. - DORIER, J. - BURNIER, Y. - STASIAK, A. Workshop on Knots and Links in Biological and Soft Matter Systems, 19.-24.09. 2016, Terst, Taliansko, zborník str. 7, pozvaná prednáška DR.

2.6.2. Vyžiadané prednášky na domácich vedeckých podujatiach

1. LACÍK, Igor. Blood glucose control by transplanted encapsulated islets: current situation. 6.-8.10.2016, Kongres Slovenskej transplantologickej spoločnosti s medzinárodnou účasťou. Košice
2. LACÍK, Igor. Mikrokapsuly pre enkapsuláciu pankreatických ostrovčekov. 8.-10.03.2016, Vedecký seminár pri príležitosti otvorenia centra CELIM PF UPJŠ Košice
3. LACÍK, I. Introduction of Polymer Institute of the Slovak Academy of Sciences as the member of Automotive Cluster Slovakia. 7.06.2016, Automotive SlovakiaRing 2016 workshop, Orechová Potôň
4. KRONEK, Juraj. Functional poly(2-oxazoline)s as building blocks for biomedical materials. In BYPOS 2016 : 6th Bratislava Young Polymer Scientists Workshop : March 13th-18th, 2016 : High Tatras, Slovakia : workshop book. - Bratislava : Young Scientists Council of Polymer Institute of SAS, 2016, p. 35. ISBN 978-80-970923-8-2.

2.6.3. Vyžiadané prednášky na významných vedeckých inštitúciách

1. LACÍK, Igor. The knowledge-based society: Polymer science as one of significant contributors. 21.03.2016, prednáška pre MSc a PhD študentov, Shanghai University, Čína
2. LACÍK, Igor. Water soluble polymers: microcapsules in diabetes treatment & polymerization in aqueous solutions. 22.03.2016, technická prednáška pre vedecký manažment univerzity, Shanghai University, Čína
3. LACÍK, Igor. Polymer Institute SAS, Bratislava, Slovakia: Research highlights and activities in biomedical field. 25.03.2016, technická prednáška pre vedecký manažment univerzity, Shanghai Co-way International Technology Transfer Center Co., Ltd Shanghai University, Čína
4. LACÍK, Igor. – ROKSTAD, AM. – OBERHOLZER, J. Multicomponent microcapsules for allogeneic islet transplantation in a comprehensive, preclinical non-human primate model. 9.-11.04.2016, JEC JDRF meeting, New York, USA
5. LACÍK, Igor. The need for creation the JEC JDRF microcapsule characterization unit. The gaps discussion. 9.-11.04.2016, JEC JDRF meeting, New York, USA
6. LACÍK, Igor. – HUTCHINSON, R. Measuring and modeling the peculiarities of aqueous-phase radical acrylamide (co)polymerization systems. 25.05.2016, Seminar for BASF manažment, BASF SE Ludwigshafen, Nemecko
7. LACÍK, Igor. – ROKSTAD, AM. – OBERHOLZER, J. Multicomponent microcapsules for allogeneic islet transplantation in a comprehensive, preclinical non-human primate model. 20.-22.09.2016, JEC JDRF meeting, Boston, USA

8. MIHALOVÁ, Andrea - UHELSKÁ, Lucia - TOMANOVÁ, K. - ALEXY,P. – LACÍK, Igor. Cryo-SEM analysis of hydrogel microspheres. Recent trends in cryo-SEM applied to biology and chemistry. 23.11.2016, Brno, ČR
9. MOSNÁČKOVÁ, Katarína. Ageing of poly(lactic acid)/poly(3-hydroxybutyrate) blend and its carbon black composite under various outdoor and laboratory conditions. Center of Polymer and Carbon Materials, Polish Academy of Sciences, Zabrze, Poľsko
10. OMASTOVÁ, Mária. Carbon nanotubes composites for advanced applications. , 19.05.2016, "P. Poni" Institute of Macromolecular Chemistry, Iasi, Rumunsko
11. RAČKO, Dušan - BENEDETTI, F. - DORIER, J. - BURNIER, Y. - STASIAK, A. Arising supercoiling drives unknotting and decatenations. 16.06. 2016, Vedecká radu Centra integratívnej genomiky, Univerzita v Lausanne, Švajčiarsko
12. ŠPITALSKÝ, Zdenko. Polymer composites with nanoparticles of graphitic structure. 9.03.2016, University of Strathclyde, Glasgow, Škótsko, Veľká Británia

2.7. Patentová a licenčná činnosť na Slovensku a v zahraničí v roku 2016

2.7.1. Vynálezy, na ktoré bol udelený patent

Na Slovensku - počet patentov: 2

Číslo PV: Patent No 194040 (Republic of Singapore)
Mená autorov: CHODÁK Ivan - ALEXY, P. - BAKOŠ, D. – BUGAJ, P. – PAVLAČKOVÁ, M. - TOMANOVÁ K. – BENOVIČ, F. – PLAVEC, R. – MIHALIK, M. – BOTOŠOVÁ, M.
Názov vynálezu: Biologically degradable polymeric composition with high deformability
Majiteľ / spolumajiteľ: Ústav polymérov SAV

Číslo PV: Patent No 2605592 (Russijskaja Federacija)
Mená autorov: CHODÁK Ivan - ALEXY, P.- BAKOŠ, D. – BUGAJ, P. – PAVLAČKOVÁ, M. - TOMANOVÁ K. – BENOVIČ, F. – PLAVEC, R. – MIHALIK, M. – BOTOŠOVÁ, M.
Názov vynálezu: Biologičeski razlagaemaja polimernaja kompozicija s vysokoj deformiruemostiju
Majiteľ / spolumajiteľ: Ustav polimerov CAB

2.7.2. Prihlásené vynálezy

Na Slovensku - počet patentov: 2

Číslo PV: Dokument 131/16
Mená autorov: RÁZGA Filip - LACÍK Igor - ČERVINKA, P.
Názov vynálezu: Droplet gun.
Majiteľ / spolumajiteľ: Ústav polymérov SAV

Číslo PV: PCT/SK2016/060002
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

2.7.3. Predané licencie

2.7.4. Realizované patenty

Finančný prínos pre organizáciu SAV v roku 2016 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
CHODÁK Ivan	APVV všeobecná výzva VEGA	1 2
LACÍK Igor	Rada APVV pre Prírodné vedy - spravodajca žiadosti o grant SKVH pri MŠŠVV SR - spravodajca návrhov pre obhajobu VEGA	12 8 1
NOVÁK Ivan	APVV všeobecná výzva VEGA	1 1
ŠPITÁLSKY Zdenko	APVV všeobecná výzva VEGA	1 1

2.9. Účasť na spracovaní hesiel do encyklopédie Beliana

Počet autorov hesiel: 0

2.10. Iné informácie k vedeckej činnosti.

Hodnotenie organizačných útvarov ústavu Vedeckou radou sa už tradične uskutočnilo formou dvojdňového kolokvia, ktoré sa konalo v polovici decembra 2016 v zasadačke Ústavu polymérov. V priebehu tohto kolokvia malo každé zo štyroch oddelení priestor na prezentáciu vedeckej, vedecko-organizačnej, popularizačnej a inej činnosti uskutočnenej v priebehu roku 2016. Kolokvium bolo organizované a vedené Vedeckou radou ústavu a pre každé oddelenie bol určený vnútroústavný hodnotiteľ. 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 2016, 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 - verejná časť obsahovala len prezentácie vedeckých pracovníkov a samotné hodnotenie oddelenia sa uskutočnilo počas neverejnej časti. VR taktiež vypracovala presné kritéria, ku ktorým sa mal hodnotiteľ zaujať stanovisko, aby sa predišlo k vyjadrovaniu sa len k štatistickým údajom. Zavedené zmeny boli prínosom a v podobnom duchu sa pravdepodobne uskutoční i nasledujúce kolovium koncom roka 2017.

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 2016 uspokojivé. Doleuvedená Tabuľka dokumentuje vývoj počtu publikácií a citácií za posledných 5 rokov. 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
2012	62	2	1307
2013	48	2	1296
2014	65	2	1664
2015	65	3	1817
2016	70	7	1784

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; v aktívnejšej organizácii tohto cyklu sa bude pokračovať v r. 2017.

V roku 2016 sa už tradične uskutočnilo i hodnotenie mladých vedeckých pracovníkov, ktorým končila v roku 2016 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 2016

Forma	Počet k 31.12.2016				Počet ukončených doktorantúr v r. 2016					
	Doktorandi				Ukončenie z dôvodov					
	celkový počet		z toho novoprijatí		ukončenie úspešnou obhajobou		predčasné ukončenie		neúspešné ukončenie	
	M	Ž	M	Ž	M	Ž	M	Ž	M	Ž
Interná zo zdrojov SAV	3	9	0	3	0	1	2	0	0	0
Interná z iných zdrojov	0	0	0	0	0	0	0	0	0	0
Externá	0	1	0	0	0	0	0	0	0	0
Spolu	3	10	0	3	0	1	2	0	0	0
Súhrn	13		3		1		2		0	

3.2. Zmena formy doktorandského štúdia

Tabuľka 3b Počty preradení z interných foriem na externé a z externej formy na interné

Pôvodná forma	Interná z prostriedkov SAV	Interná z prostriedkov SAV	Interná z iných zdrojov	Interná z iných zdrojov	Externá	Externá
Nová forma	**Interná z iných zdrojov**	**Externá**	**Interná z prostriedkov SAV**	**Externá**	**Interná z prostriedkov SAV**	**Interná 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 2016 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
Mgr. Anna Zahoranová	interné štúdium hradené z prostriedkov SAV	9 / 2012	8 / 2016	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. Zoznam akreditovaných študijných odborov s uvedením VŠ

Tabuľka 3d 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, Bratislava
makromolekulová chémia	4.1.19	Fakulta chemickej a potravinárskej technológie STU, Bratislava
technológia makromolekulových látok	5.2.21	Fakulta chemickej a potravinárskej technológie STU, Bratislava

Tabuľka 3e 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)	Ing. Igor Lacík, DrSc. (Fakulta chemickej a potravinárskej technológie STU)	Ing. Anita Eckstein, PhD. (IIa)
Prof. Ing. Tomáš Bleha, DrSc. (fyzikálna chémia)	Ing. Igor Lacík, DrSc. (Univerzita T. Bati, Zlín, ČR)	Mgr. Zuzana Kroneková, PhD. (IIa)
Prof. Ing. Tomáš Bleha, DrSc. (fyzikálna chémia)	Ing. Mária Omastová, DrSc. (Fakulta prírodných vied UCM)	Mgr. Jaroslav Mosnáček, DrSc. (DrSc., Slovenská Akadémia Vied)
RNDr. Peter Cifra, DrSc. (fyzikálna chémia)		Mgr. Anna Zahoranová, PhD. (PhD., Slovenská Akadémia Vied)
RNDr. Peter Cifra, DrSc. (makromolekulová chémia)		
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. (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)		

3.5. Údaje o pedagogickej činnosti

Tabuľka 3f Prednášky a cvičenia vedené v roku 2016

PEDAGOGICKÁ ČINNOSŤ	Prednášky		Cvičenia a semináre	
	doma	v zahraničí	doma	v zahraničí
Počet prednášateľov alebo vedúcich cvičení	8	0	6	1
Celkový počet hodín v r. 2016	40	0	1065	200

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

Tabuľka 3g Aktivity pracovníkov na VŠ

1.	**Počet pracovníkov, ktorí pôsobili ako vedúci alebo konzultanti diplomových a bakalárskych prác**	4
2.	**Počet vedených alebo konzultovaných diplomových a bakalárskych prác**	5
3.	**Počet pracovníkov, ktorí pôsobili ako školitelia doktorandov (PhD.)**	10
4.	**Počet školených doktorandov (aj pre iné inštitúcie)**	14
5.	**Počet oponovaných dizertačných a habilitačných prác**	6
6.	**Počet pracovníkov, ktorí oponovali dizertačné a habilitačné práce**	2
7.	**Počet pracovníkov, ktorí pôsobili ako členovia komisií pre obhajoby DrSc. prác**	3
8.	**Počet pracovníkov, ktorí pôsobili ako členovia komisií pre obhajoby PhD. prác**	10
9.	**Počet pracovníkov, ktorí pôsobili ako členovia komisií, resp. oponenti v inauguračnom alebo habilitačnom konaní na vysokých školách**	2

3.6. Iné dôležité informácie k pedagogickej činnosti

Vedeckí pracovníci Ústavu polymérov sa aktívne podieľajú aj na výchove študentov a doktorandov. V roku 2016 pracovníci ústavu pôsobili pedagogicky ako prednášatelia semestrálnych prednášok a seminárov pre študentov na Prírodovedeckej fakulte UK, Fakulte chemickej a potravinárskej technológie STU v Bratislave a Materiálovotechnickej fakulte STU so sídlom v Trnave.
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 2016 sme získali dvoch nových doktorandov zo slovenských univerzít a jedného doktoranda zo Srbska.
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 2016 konalo v septembri, pričom doktorandi prezentovali výsledky dosiahnuté v priebehu ukončeného akademického roka 2015/2016. 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 ukončil jeden doktorand.

V roku 2016 sme opätovne zorganizovali pre širokú verejnosť a pre študentov stredných a vysokých škôl Deň otvorených dverí, ktorý, ako každý rok, sa stretol s veľkým záujmom. Počas tohto podujatia bola zriadená Vedecká kaviareň, v ktorej stredoškoláci a vysokoškoláci diskutovali s kolegami z nášho ústavu Mgr. Martinom Dankom, PhD., Mgr. Zuzanou Kronekovou, PhD., Ing. Filipom Rázgom, PhD. a Mgr. Veronikou Némethovou o rôznych témach týkajúcich sa polymérov. Okrem Vedeckej kaviarne mali návštevníci možnosť zistiť viac o polyméroch i pracovisku pri návštevách oddelení ústavu a malých prezentáciách vo vstupnej hale.

4. Medzinárodná vedecká spolupráca

4.1. Medzinárodné vedecké podujatia

4.1.1. Medzinárodné vedecké podujatia, ktoré organizácia SAV organizovala v roku 2016 alebo sa na ich organizácii podieľala, s vyhodnotením vedeckého a spoločenského prínosu podujatia

BYPoS 2016 – Bratislava Young Polymer Scientists workshop,
Hotel Bachledka, Ždiar, Slovenská republika, 46 účastníkov, 14.03.-18.03.2016

Rok 2016 je úrodným rokom na konferencie, ktoré organizuje Ústav polymérov SAV. Prvou z nich bol BYPoS – Bratislava Young Polymer Scientists workshop. 6. Ročník BYPoSu sme úspešne absolvovali v hoteli Bachledka v Ždiari v dňoch 14. – 18. marca 2016.
Tento ročník mal opäť bohaté zastúpenie, zúčastnilo sa na ňom 46 vedcov z 8 krajín EU (Slovensko, Česká republika, Poľsko, Maďarsko, Rakúsko, Nemecko, Lichtenštajnsko a Rumunsko). Hlavné prednášky mali pozvaní prednášatelia, ktorí prijali aj úlohu chairmenov a členov výberovej komisie v súťaži o najlepšiu prezentáciu. Týmto ďakujeme Dr. Jürgenovi Pionteckovi z Leibniz Institute of Polymer Research Dresden v Nemecku, prof. Christianovi Paulikovi z Johannes Kepler University v Linzi, Rakúsko, Dr. Károly Rennerovi z Budapest University and Technology v Maďarsku a nášmu kolegovi Dr. Jurajovi Kronekovi za ich čas, vedecký prínos a profesionalitu.
Novinkou bola súťaž o najlepšiu prezentáciu, do ktorej sa nám podarilo získať krásne vecné dary od firmy BASF Slovensko. Víťazov vyberala komisia zložená z pozvaných prednášateľov a prof. V. Harabagiou (Rumunsko). Prvé miesto získal Markus Kury (Rakúsko), druhé miesto patrilo mladej vedkyni Hane Kostkovej (Česká republika) a na treťom mieste sa umiestnila študentka Nóra Hegyesi (Maďarsko). Špeciálnu cenu získala sedemnásťročná gymnazistka z Myjavy, Kristína Talábová, ktorá svojim prejavom a prezentáciou ukázala guráž a všetci prítomní len konštatovali, že má pred sebou sľubnú vedeckú budúcnosť. Prezentovala výsledky získané v rámci SOČ pod vedením A. Šiškovej z ÚPo.

New trends in solar cells and WG and MC meeting of COST MP 1307,
Lindner Hotel Gallery Central, Bratislava, Slovensko, 75 účastníkov, 19.04.-22.04.2016

Trojdňová medzinárodná konferencia New trend in solar cells 2016 sa konala v Bratislavskom hoteli Lindner od 19. do 21. apríla. Podujatie bolo iniciované projektom COST MP 1307 StableNextSol. Jeho hlavnými organizátormi boli Ing. Mária Omastová, DrSc. z Ústavu polymérov SAV, RNDr. Eva Majková, DrSc. z Fyzikálneho ústavu SAV a Dr. Monica Lira Cantu z Catalan Institute of Nanoscience and Nanotechnology v Barcelone.
Konferencia sa zamerala na najnovšie poznatky, aktuálne výzvy a perspektívy vývoja nových solárnych článkov vrátane príslušných charakterizačných techník, ktoré sa používajú na testovanie ich stability. Hlavnými témami boli: organické solárne články, farbivom senzibilizované solárne články, solárne články na báze perovskitov, organické-anorganické hybridné solárne články, a taktiež modelovanie týchto zariadení.
Významnými hosťami a plenárnymi prednášateľmi boli prof. Tsutomu Miyasaka z Toin University v Yokohame, Japonsko, ktorý predniesol prednášku o pokrokoch v hybridných zariadeniach na báze perovskitov pre fotovoltaiku a optoelektroniku a prof. David S. Ginley, z National Renewable Energy Laboratory, Golden, USA. Prof. Maria Antonietta Loi, z University of Groningen v Holandsku predniesla prednášku s názvom Organické medzivrstvy pre efektívne a stabilné hybridné solárne články. Zaujímavá bola aj prednáška prof. Ángely Sastre Santos, z Universidad Miguel Hernández v Španielsku na tému: Dodanie farby solárnym článkom malými molekulami. Na záver konferencie prof. Markus Scharber, z Johannes Kepler University Linz, z Rakúska predniesol

prednášku o účinnosti organických solárnych článkov, ktorá je veľmi dôležitým parametrom pre ich aplikácie.
Solárne fotovoltické systémy pracujú na princípe fotoelektrického javu - priamej premeny svetla na elektrickú energiu. Predčasom sa začal skúmať nový typ solárnych článkov, ktoré používajú takzvanú perovskitovú štruktúru. Pôvodný perovskit je prírodný minerál – oxid vápenato-titaničitý ($CaTiO_3$), pomenovaný podľa ruského mineralóga L. A. Perovského. No perovskitovskú štruktúru môžu tvoriť aj iné materiály, ktoré kryštalizujú v typickej kubickej sústave. Syntetické perovskity sú materiálom pre výrobu tenkovrstvových solárnych článkov a článkov na báze svetlocitlivých farbív, o vývoji ktorých sme počuli niekoľko zaujímavých prednášok. Ide o interdisciplinárny výskum, prepojenie fyziky a chémie, ktorý prináša najmä nové typy materiálov. Keďže v organickej fotovoltaike neexistuje chémia bez fyziky a naopak, takéto stretnutia fyzikov a chemikov sú veľmi potrebné, aby došlo k ich vzájomnému čo najlepšiemu porozumeniu.
Organické a hybridné solárne články majú oproti kremíkovým výhodu, že je možné ich pri nízkych nákladoch vyrábať vo veľkých množstvách metódou tlače. Takto sa dajú výrazne znížiť náklady. Lenže ak majú byť organické solárne články naozaj lacné, je potrebné zvýšiť ich účinnosť. Ďalšou otázkou je životnosť organických solárnych článkov, ale výhodná cena a dobrá účinnosť im otvárajú výborné šance na široké uplatnenie.
Stretnutie odborníkov pracujúcich v tejto oblasti interdisciplinárneho výskumu obohatilo všetkých zúčastnených o nové vedecké výsledky a nápady, ktoré veríme, že ovplyvnia vývoj nových solárnych článkov.
Tri dni konferenčného rokovania odborníkov pokračovali prednáškami v dvoch paralelných sekciách. Celkovo na podujatí odznelo 5 pozvaných plenárnych prednášok, 21 hlavných prednášok a 19 krátkych prednášok. Počas konferencie sa konala aj postrová sekcia. Celkovo sa na konferencii zúčastnilo 75 odborníkov z 23 krajín. Z prezentovaných prednášok a postrov organizátori vydali Zborník abstraktov, ktorý má 130 strán (New Trends in Solar Cells : book of abstracts. Bratislava : Polymer Institute of SAS, 2016. 128 p. ISBN 978-80-970923-9-9. Typ: FAI)

IX. Slovensko-Česká konferencia Polyméry 2016,
Hotel Academia – KC Stará Lesná, 70 účastníkov, 08.06.-10.06.2016

IX. Slovensko – Česká konferencia POLYMERY 2016 nadväzuje na dvojročnú tradíciu spoločných stretnutí, podľa ktorej sú konferencie organizované buď Ústavom polymérov SAV alebo Ústavom makromolekulární chemie AV ČR, v.v.i. v Prahe. Po rozdelení Československej republiky, pri vzájomných stretnutiach riaditeľov spomínaných inštitúcií, vznikla myšlienka organizovať akciu, na ktorej by sa prezentovali vedecké výsledky príbuzných ústavov a ktorá by bola finančne nenáročná, aby sa na nej mohli zúčastniť aj mladí vedeckí pracovníci. Cieľom týchto konferencií je poskytnúť prehľad o výskume a aplikácií v oblastiach makromolekulovej chémie na Slovensku a v Českej republike. Vznikla z toho tradícia spoločných stretnutí, ktorých sa zúčastňujú nielen vedci uvedených dvoch inštitúcií, ale aj vysokoškolskí pracovníci a o účasť sa zaujímajú aj firmy zaoberajúce sa s podobnou tématikou.
V krásnom prostredí Vysokých Tatier sa tento rok zišlo 70 účastníkov z rôznych vedeckých inštitúcií a vysokých škôl. Organizátorom sa podarilo zabezpečiť zaujímavý a kvalitný vedecký program. Odznelo 29 prednášok a v diskusii sa pokračovalo pri postrových prezentáciách. Úvodnú prednášku predniesol prof. Ing. Karel Ulbrich, DrSc. zakladajúci riaditeľ týchto konferencií z ÚMCH AV ČR, v ktorej pútavou formou hovoril o dosiahnutých výsledkoch v liečbe nádorových ochorení.
Vedecký program bol rozdelený do troch oblastí výskumu:

- Biologicky aktívne polyméry a funkčné biomateriály
- Polymérne (nano) kompozity a aplikácie polymérnych materiálov
- Nové metódy v syntéze a charakterizácií polymérov

Striedali sa prezentácie skúsených vedcov s prednáškami mladších vedeckých pracovníkov a doktorandov. Každá z nich bola spojená s bohatou diskusiou.

Mimoriadny ohlas u všetkých vedeckých pracovníkov vyvolala prednáška účastníka z CVTI, v ktorej podrobne vysvetlil možnosti, postup a financovanie patentových prihlášok, ktoré zabezpečuje Centrum vedecko-technických informácií v Bratislave.
K vysokej úrovni konferencie prispeli aj zástupcovia firiem Metller Toledo, Wyatt Technology Europe a Nexis Fibers prezentáciou svojich výrobkov, technológií a služieb.
Popri odbornom programe mali účastníci možnosť uskutočniť výlet do tatranskej prírody a vo večerných hodinách pokračovať v diskusiách v príjemnom až rodinnom prostredí Kongresového centra ACADEMIA.
X. jubilejná konferencia Polymery 2018 bude organizovaná o dva roky kolegami z ÚMCH AV ČR v Prahe.

BIMac 2016 - 22. Bratislavská konferencia o makromolekulách, Hotel Holiday Inn, Bratislava, Slovensko, 60 účastníkov, 06.09.-09.09.2016

Tesne po letnom dovolenkovom období, v dňoch od 6. do 9. septembra 2016 sa v hoteli Holiday Inn v Bratislave uskutočnila konferencia BIMac 2016 (www.polymer.sav.sk/bimac), ktorá je pokračovaním dlhoročnej tradície Bratislavskej medzinárodnej konferencie o makromolekulách organizovanej Ústavom polymérov SAV. Tohto roku to bol už jej 22. ročník s podnázvom „Polymers with Tailored Architecture and Properties“.
Pozvanie organizátorov prijali významné kapacity v oblasti polymérnej chémie ako sú prof. Krzysztof Matyjaszewski z Carnegie Mellon University v USA, prof. Michael Buback z Gőttingen University v Nemecku, prof. David Haddleton z University of Warwick, Veľká Británia a prof. Hirotaka Ihara z japonskej Kumamoto University.
Konferencia prebehla v príjemnej vedeckej atmosfére, plnej zaujímavých prednášok z oblasti syntézy polymérov a polymérnych materiálov a ich charakterizácie. Študenti mali možnosť prezentovať svoje výsledky vo forme prednášky alebo postra pred komisiou zloženou z významných vedeckých kapacít. Cenu za najlepší študentský poster si prevzal Johannes Steindl z Rakúska. Cena za najlepšiu študentskú prezentáciu putovala do rúk Jennifer Schultze z Nemecka.
Organizátori konferencie BIMac 2016 privítali na Slovensku vyše 60 účastníkov z viacerých krajín EÚ, Japonska, Číny, USA, Taiwanu, Ruska, Ukrainy a Qataru.
Štvrtkové konferenčné popoludnie bolo venované oslave krásneho životného jubilea prof. Eberharda Borsiga, ktorý ako prvý publikoval systém umožňujúci vratnú deaktiváciu pri radikálovej polymerizácii. V rámci oslavy sa konal seminár venovaný prof. Borsigovi. Po úvodnom predstavení jeho vedeckej práce nasledovala plenárna prednáška prof. Matyjaszewskeho, jedného zo zakladateľov v súčasnosti najvýznamnejšej kontrolovanej radikálovej polymerizácie. Vo svojej prednáške ukázal, aký význam má v súčasnosti práve mechanizmus vratnej deaktivácie pri príprave nových materiálov s požadovanými vlastnosťami. Následne prof. Borsigovi zablahoželali nielen účastníci konferencie, ale aj dlhoroční kolegovia z Ústavu polymérov SAV, kolegovia z Fakulty chemickej a potravinárskej technológie, Dr. D. Měřinská z FT UTB v Zlíně a za kolegov zo Slovenskej chemickej spoločnosti mu prečítal a odovzdal ďakovný list a sladkú tortu s logom SCHS jej súčasný predseda prof. Viktor Milata, DrSc.

2nd Meeting of ABIOG project partners & Workshop, Ústav polymérov SAV, Bratislava, 30 účastníkov, 15.11.-16.11.2016

V dňoch 15.-16.11.2016 sa na Ústave polymérov SAV uskutočnilo už druhé stretnutie partnerov projektu pod akronymom ABIOG. Uvedený projekt je finančne podporovaný Višegrádskym Fondom a trvá od 1.09.2016 do 28.02.2017.
Cieľom projektu je vytvoriť v európskom kontexte konkurencieschopnú sieť partnerov z riešiteľských inštitúcií so zameraním na výskum a vývoj v oblasti biomedicíny. K partnerom ABIOG projektu patria okrem Ústavu polymérov SAV aj Ústav Makromolekulárni Chémie AV ČR, Cracow University of Technology a Budapest University of Technology and Economics. Na tomto stretnutí sa zúčastnili nielen zástupcovia z každej z vyššie uvedených inštitúcií ale aj hostia z

Center of Polymer and Carbon Materials z Zabrze, Poľsko. Odznelo 15 veľmi zaujímavých prednášok ako výber z mnohých tém riešených na zúčastnených inštitúciách.
Ústav polymérov SAV bol reprezentovaný minimálne jedným zástupcom z každého oddelenia. Hostí privítala za naše pracovisko úvodným slovom Mgr. Zuzana Kroneková, PhD. Ústav polymérov SAV predstavil pán riaditeľ Ing. Igor Lacík, DrSc. A následne svoje odborné prezentácie predniesli Mg. Juraj Kronek, PhD., Mgr. Katarína Mosnáčková, PhD., Mgr. Zuzana Benková, PhD., Mgr. Martin Danko, PhD, Ing. Anita Eckstein Andicsová, PhD. a Mgr. Cristian Peptu, PhD. 16.11. v dopoludňajších hodinách sme organizovali návštevu laboratórií.

4.1.2. Medzinárodné vedecké podujatia, ktoré usporiada organizácia SAV v roku 2017 (anglický a slovenský názov podujatia, miesto a termín konania, meno, telefónne číslo a e-mail zodpovedného pracovníka)

7th International Conference Polymeric Materials in Automotive & 23rd Slovak Rubber Conference,/VII. medzinárodná konferencia o polymérnych materiáloch v automobilovom priemysle PMA 2017, Konferenčné centrum Lindner Hotel - Bratislava, Slovenská republika, 29.05.-31.05.2017, (Ivan Chodák, 02/ 3229 4340, upolchiv@savba.sk)

BYPoS 2017 - 7th Bratislava Young Polymer Scientists workshop/BYPoS 2017- 7th Bratislava Young Polymer Scientists workshop, Hotel Glamour, Zemplínska Šírava, Slovensko, 40 účastníkov, 12.06.-16.06.2017, (Alena Šišková, 02/ 3229 4301, upolalsi@savba.sk)

4.1.3. Počet pracovníkov v programových a organizačných výboroch medzinárodných konferencií

Tabuľka 4a Programové a organizačné výbory medzinárodných konferencií

Typ výboru	Programový	Organizačný	Programový i organizačný
Počet členstiev	1	8	12

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)

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
Kronek Juraj	Grant FNP, formát SONATA, Poľsko	1
Lacík Igor	ETH Zurich (grant na prístroje)	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, 15 x Conference application for endorsement

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 2016 pokračovala v charakterizácií derivátov s benzo(tris)tiazolínovým akceptorom a aminoarylovým donorom v polymérnych matriciach. Zvyšovanie kvantového výťažku v prostrediach s vyššou viskozitou bolo využité na monitorovanie procesu voľno-radikálovej a kontrolovanej radikálovej polymerizácie. Spoločná práca bude v najbližšej dobe odoslaná do SCI časopisu.

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 2016 bola zameraná predovšetkým na pokračovanie zavádzania spoločného patentu do priemyselnej praxe. Pomerne veľké úsilie bolo potrebné venovať organizačným otázkam súvisiacim s podaním viacerých národných patentov.Súčasne sa začali nové práce súvisiace s výskumom možností využitia termoplastického škrobu ako matrice pre zmesi a

kompozity na báze biodegradovateľných kompostovateľných plastov.
Výstup:

1. MOSNÁČKOVÁ, Katarína - ŠIŠKOVÁ, Alena - JANIGOVÁ, Ivica - KOLLÁR, Jozef - ŠLOSÁR, M. - CHMELA, Štefan - ALEXY, P. - CHODÁK, Ivan - BOČKAJ, J. - MOSNÁČEK, Jaroslav. Ageing of plasticized poly(lactic acid)/poly(beta/hydroxybutyrate) blend films under artificial UV irradiation and under real agricultural conditions during their application as mulches. In Chemical Papers, 2016, vol. 70, no. 9, p. 1268-1278. (1.326 - IF2015). ISSN 0366-6352. ADDA01 234696

Názov univerzity/vysokej školy a fakulty: Materiálovotechnologická fakulta STU v Trnave
Druh spolupráce (spoločné pracovisko alebo iné): Ústav výrobných technológií, Výskumný ústav zváračský
Začiatok spolupráce: 2012
Zameranie: Výskum vlastností vybraných typov adhéznych spojov.
Zhodnotenie: Skúmali sa adhézne a povrchové vlastnosti ocele a hliníka a jeho zliatin, ktoré sa navzájom kombinujú s polymérnymi materiálmi pre prípravu obalových materiálov. Zvýšenie adhézie polymérov ku oceli a hliníku je možné dosiahnuť po ich povrchovej modifikácii polymérov (polyolefínov) bariérovou plazmou pri atrmosférickom tlaku vo vzduchu. Po úprave korónovým výbojom vzrástla povrchová energia polymérov najmä v dôsledku polárnej zložky povrchovej energie. Nízkoteplotnou plazmou bol upravený aj povrch ocele a hliníka a jeho zliatin a bola stanovená povrchová energia plazmou upravených povrchov kovov a jej polárna zložka. Skúmala sa aj pevnosť adhéznych spojov ku polyolefínom pri použití polyuretánových adhezív. Pevnosť adhéznych spojov v prípade modifikácie polyolefínu a hliníka plazmou bariérového výboja vo vzduchu vzrástla v prípade zliatin hliníka 5 násobne a v prípade ocele 3 násobne.
Výstupy:

1. NOVÁK, Igor - MICHALEC, I. - VALENTIN, Marian - MARÔNEK, M. - ŠOLTÉS, L. - MATYAŠOVSKÝ, J. - JURKOVIČ, P. Investigation of various method for steel surface modification. In *Process Advancement in Chemistry and Chemical Engineering Research*. - Oakville : Apple Academic Press, CRC Press, 2016, chapter 14, s. 191-202. ISBN 978-1-77188-105-0.
2. NOVÁK, Igor - MICHALEC, I. - *VALENTIN, Marian* - MARÔNEK, M. - ŠOLTÉS, L. - MATYAŠOVSKÝ, J. - JURKOVIČ, P. Investigation of various method for steel surface modification. In *The Chemistry and Physics of Engineering Materials*. Volume 1. Modern Analytical Methodologies. - Oakville, Canada : Apple Academic Press, 2016, chapter 18, p. 241-253. ISBN 978-1-77188-079-4.

Názov univerzity/vysokej školy a fakulty: Drevárska fakulta TUZVO
Druh spolupráce (spoločné pracovisko alebo iné): zmluva o spolupráci
Začiatok spolupráce: 2012
Zameranie: Štúdium povrchových vlastností vybraných druhov dreva
Zhodnotenie: Pri štúdiu povrchových vlastností dubového, bukového a jaseňového dreva upraveného atmosférickou plazmou vo vzduchu sa zistilo, že povrchová drsnosť dreva na základe výsledkov AFM meraní významne rastie. Povrchová energia sa po 60 s modifikácie atmosférickou plazmou vo vzduchu zvýšila o 12 – 22,5 mJ.m-2, polárna zložka povrchovej energie sa zvýšila 5 násobne. Výstupy:

1. BEKHTA, P. - MAMONOVÁ, M. - SEDLIAČIK, J. - NOVÁK, Igor. Anatomical study of short-term thermo-mechanically densified alder wood veneer with low moisture content. In European Journal of Wood and Wood Products, 2016, vol.74, p. 643-652. (1.081 - IF2015). (2016 - Current Contents, WOS). ISSN 0018-3768.
2. NOVÁK, Igor - *KRUPA, Igor* - SEDLIAČIK, J. - ŽIGO, Ondrej - JURKOVIČ, P. - MATYAŠOVSKÝ, J. Skumanie mechanickych, povrchovych a adheznych vlastnosti mikrokompozitov polyolefinu s drevom datlovej palmy - Investigation of mechanical, surface and adhesive properties of date palm wood polyolefin micro composites. In Plastko 2016 : sbornik prisp

Názov univerzity/vysokej školy a fakulty: Vysoká škola výtvarných umení v Bratislave
Druh spolupráce (spoločné pracovisko alebo iné): Oddelenie textilu -spolupráca v rámci projektu

Začiatok spolupráce: 2015
Zameranie: Prepojenie textilných technológii s abstraktným umením
Zhodnotenie: Spolupráca je zameraná na využitie elektrostatického zvlákňovania v oblasti úžitkového umenia.
• TEXTILE ART OF TODAY, medzinárodná putovná výstava súčasnej umeleckej textilnej tvorby pod záštitou ministrov kultúry krajín V4. Poprad (február – marec 2016), Bialsko-Biała (máj – august 2016), Györ (september – október 2016), Uherské Hradište (november 2016 – január 2017);
• Výstava NANO-Art, Ústav polymérov, november 2016 – január 2017

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

6.3. Iná činnosť využiteľná pre potreby spoločenskej praxe

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): 2016
Objem získaných prostriedkov v bežnom roku (€): 545
Stručný opis výstupu/výsledku: Pomocou kónického kalorimetra bola testovaná horľavosť rozličným spôsobom upravených polyuretánových pien pre kreslá a lôžka v zdravotníctve.
Zhodnotenie:

Názov kontraktu: Termická oxidácia polyamidov študovaná chemiluminiscenciou
Partner(i): Clariant Hamburg
Začiatok spolupráce (v súlade s podpísaným kontraktom): 2015
Ukončenie spolupráce (ak ide o spoluprácu v krátkom období): 2016
Objem získaných prostriedkov v bežnom roku (€): 672
Stručný opis výstupu/výsledku: Neizotermickou chemiluminiscenciou bola otestovaná termická stabilita vzoriek polyamidov stabilizovaných zmesnými systémami fenolických antioxidantov.
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 (€): 34000
Stručný opis výstupu/výsledku: získanie individuálnych rýchlostných konštánt pre rôzne homopolymerizačné a kopolymerizačné systémy.
Zhodnotenie: v spolupráci s partnermi sa pokračovalo v definovaní systémov pre štúdium, a navrhovaní spôsobov charakterizácie kinetiky polymerizácie a podmienok charakterizácie molekulových hmotností metódou SEC.

Názov kontraktu: Meranie oxidácie stabilizovaných APP.
Partner(i): University of Linz, Rakúsko
Začiatok spolupráce (v súlade s podpísaným kontraktom): 2016
Ukončenie spolupráce (ak ide o spoluprácu v krátkom období): 2016
Objem získaných prostriedkov v bežnom roku (€): 320
Stručný opis výstupu/výsledku: Chemiluminiscenčnou metódou pomocou prístroja Lumipol bola meraná oxidácia stabilizovaných ataktických polypropylénov.
Zhodnotenie:

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): 2016
Objem získaných prostriedkov v bežnom roku (€): 27174
Stručný opis výstupu/výsledku: Štúdium kinetiky homopolymerizácie a kopolymerizácie s metylmetakrylátom dvoch nových monomérov určených pre adhezíva aplikované do "self-etching" dentálnych kompozitov. V prípade kopolymerizácie sa okrem kinetiky polymerizácie jednalo aj o určenie kopolymerizačných parametrov. Vypracovanie a zaslanie rukopisu do redakcie časopisu. Začiatkom roku 2017 sa plánuje pracovné stretnutie zamerané na obhajobu záverečnej správy a diskusia o budúcej náplni v rámci plánovaného predĺženia projektu.
Zhodnotenie: Zachovanie kontinuity spolupráce s Ivoclar Vivadent bolo významným vedeckým ako aj finančným prínosom pre ÚPo.

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): 2016
Objem získaných prostriedkov v bežnom roku (€): 9380
Stručný opis výstupu/výsledku: Cieľom je návrh materiálov na báze polymérov alebo elastomérov s vysokou pevnosťou v šmyku a tlaku a s vysokým koeficientom trenia. Otestovalo sa celkove päť rozličných materiálov v rozličných modifikáciách (líšiacich sa najmä koncentráciami aditív, celkove okolo 30 receptúr) a získali sa základné poznatky o možnostiach a obmedzeniach prípravy materiálov s definovanými vlastnosťami podľa požiadaviek zadávateľa.
Zhodnotenie: Prvá etapa sa ukončila demonštračnými laboratórnymi pokusmi v prítomnosti zástupcov objednávateľa. Tieto ukážky prebehli vcelku uspokojivo a v súčasnosti sa rokuje o podmienkach a cieľoch druhej etapy v roku 2017.

Názov kontraktu: Opis horľavosti epoxidových živíc
Partner(i): Mobichem, Jeruzalem, Izrael
Začiatok spolupráce (v súlade s podpísaným kontraktom): 2016
Ukončenie spolupráce (ak ide o spoluprácu v krátkom období): 2016
Objem získaných prostriedkov v bežnom roku (€): 545
Stručný opis výstupu/výsledku: Pomocou kónického kalorimetra bola testovaná horľavosť epoxidových kompozitov.
Zhodnotenie:

Názov kontraktu: Výskum reakčného mechanizmu... (kompletný názov obsahuje utajené informácie)
Partner(i): CEIT Žilina, 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: Cieľom kontraktu bolo stanoviť chemické a fyzikálne pochody,

ktoré prebiehajú v gumárenských zmesiach a vulknizátoch pre špeciálne použitie počas dlhodobého tepelného zaťaženia pri teplotách 150o C a vyššie. V prvej etape sa urobil výber metód pre hodnotenie tak, aby výsledky spĺňali požiadavky zadávateľa. Podstatným parametrom boli zmeny mechanických vlastností zmesi pri ohreve za prístupu vzduchu pri rozličných teplotách počas 5 – 30 hodín. Výsledky sa doplnili meraniami DMTA a FTIR, v niektorých prípadoch sa použili aj ďalšie metódy. V ďalšom postupe sa skúmané zmesi a vulkanizáty modifikovali z hľadiska náhrady jednotlivých komponentov inými aditívami a výsledky vplyvu teploty sa porovnávali s referenčnými zmesami, ktoré predstavujú v súčasnosti používané receptúry vo výrobe.
Zhodnotenie: V niektorých prípadoch sa našli postupy, ktoré vedú k zvýšeniu tepelnej odolnosti jednotlivých vulkanizátov. Tieto sa budú v ďalšej etape práce testovať v poloprevádzkovom rozsahu. Podrobnejší popis výsledkov nie je možné zverejniť vzhľadom na záujmy zadávateľa zohľadnené vo formulácii zmluvy.

7.3. Iná činnosť využiteľná pre potreby hospodárskej praxe

Pomerne početné práce týkajúce sa krátkych 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. Zoznam firiem je uvedený nižšie spolu s podstatou meraní a získaným finančným obnosom.

Merania a spolupráce s firmami	
SCA Slovakia: Charakterizácia materiálov	170,00 €
Elastorsa, a.s. Martin: Vlastnosti gumárenských zmesí	450,00 €
Riešenie reklamácie od zákazníka	1 345,00 €
Sosna, s.r.o., Ostrava:Merania tepelnej odolnosti	180,00 €
SCA Slovakia: Charakterizácia materiálov	288,00€
Werba Chem, Austria: Merania tepelnej odolnosti	340,00 €
VUB Bratislava: Konzultácie riešenia zamorenia budovy Frostexom	440,00€
Envirocare, s.r.o. Nitra: Merania reológie a DMTA	2 140,00 €
SCA Slovakia: Charakterizácia materiálov	427,50 €
VIPO, a.s. Partizánske: Merania DMTA	2 100,00 €

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 pracovnej skupiny pre Biomedicínu a biotechnológiu pre vedecké a výskumné kapacity RIS3 SK
	Ministerstvo školstva, vedy, výskumu a športu SR	člen Slovenskej komisie pre vedecké hodnosti SKVH – podskupina odborov vedy a techniky: chemické vedy

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

Názov expertízy: expert pre akreditáciu skúšobných laboratórií pre SNAS
Adresát expertízy: Slovenská národná akreditačná služba
Spracoval: Prof. Ing. Ivan Chodák, DrSc.

Názov expertízy: člen technickej komisie 39 PLASTY
Adresát expertízy: Slovenský ústav technickej normalizácie
Spracoval: Ing. Igor Novák, PhD.

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

9. Vedecko-organizačné a popularizačné aktivity

9.1.Vedecko-popularizačná činnosť

9.1.1. Najvýznamnejšia vedecko-popularizačná činnosť pracovníkov organizácie SAV

Tabuľka 9a Vedecko-popularizačná činnosť pracovníkov organizácie SAV

Meno	Spoluautori	Typ[1]	Názov	Miesto zverejnenia	Dátum alebo počet za rok
Mgr. Zuzana Benková, PhD.		PB	Zasimulujme si	Deň otvorených dverí, ÚPo SAV	10.11.2016
Mgr. Zuzana Benková, PhD.		EX	Zasimulujme si	Deň otvorených dverí, ÚPo SAV	10.11.2016
Mgr. Zuzana Benková, PhD.		PB	Zasimulujme si	Európska noc výskumníkov – 10. ročník, stánok ÚPo SAV pre verejnosť, Stará tržnica	30.9.2016
Mgr. Zuzana Benková, PhD.		EX	Zasimulujme si	Európska noc výskumníkov – 10. ročník, stánok ÚPo SAV pre verejnosť, Stará tržnica	30.9.2016
Mgr. Martin Danko, PhD.		PB	Vedecká kaviareň	Deň otvorených dverí, ÚPo SAV	10.11.2016
Prof. Ing. Ivan Chodák, DrSc.	Alexy Pavol, Bakoš Dušan	DO	Spektrum vedy	RTVS	24.9.2016
Ing. Lucia Kleščíková, PhD.		PB	Plasty medzi nami	Európska noc výskumníkov – 10. ročník, stánok ÚPo SAV pre verejnosť, Stará tržnica	30.9.2016
Mgr. Zuzana Kroneková, PhD.		PB	Vedecká kaviareň	Deň otvorených dverí, ÚPo SAV	10.11.2016
Ing. Igor Lacík, DrSc.		TV	Anjeli strážni Igora Lacíka	STV 2	27.2.2016
Ing. Igor Lacík, DrSc.		IN	Hhostia v štúdiu: M. Vaškovičová a I. Lacík o Krištáľovom krídle	http://www.ta3.com/clanok/1077483/hostia-v-studiu-m-vaskovicova-a-i-lacik-o-kristalovom-kridle.html	2.2.2016
Ing. Igor Lacík, DrSc.		TV	Hostia v štúdiu: M. Vaškovičová a I. Lacík o Krištáľovom krídle	TA 3	2.2.2016
Ing. Igor Lacík, DrSc.		IN	Chemik, ktorý Slovensko dostal medzi svetovú elitu - Pacientom s cukrovkou svitá nová nádej	Topky.sk	2016
Ing. Igor Lacík, DrSc.		TV	Igor Lacík a Oddelenie pre výskum biomateriálov - Veda a Technika VaT	STV 2	11.2.2016
Ing. Igor Lacík, DrSc.		IN	Laureát Krištáľového krídla 2015	https://www.rtvs.sk/televizia/archiv/10196/86427	24.1.2016

Ing. Igor Lacík, DrSc.		TV	Laureát Krištáľového krídla 2015	Nová budova SND, Bratislava	24.1.2016
Ing. Igor Lacík, DrSc.		PB	Polymérne mikrokapsuly a liečba cukrovky	Veda v Centre – CVTI, Bratislava	25.2.2016
Ing. Igor Lacík, DrSc.		PB	Prednáška pre združenie diabetikov DIADOR	Primaciálny palác, Bratislava https://youtu.be/DFIYltUCEvQ	28.11.2016
Ing. Igor Lacík, DrSc.		PB	Reprezentácia ÚPo na akcii k Wichterleho šošovke	Primaciálny palác, Bratislava	9.4.2016
Ing. Igor Lacík, DrSc.		IN	rozhovor pre portal science.sk – pri liečbe cukrovky musíme imunitný system oklamať	http://science.dennikn.sk/clanky-a-rozhovory/ziva-priroda-a-chemicke-vedy/lekarstvo/6171-pri-liecbe-cukrovky-musime-imunitny-system-oklamat	2016
Ing. Igor Lacík, DrSc.		TL	Svetový deň diabetu. Revolúcia v liečbe diabetu	Nový čas - príloha	14.11.2016
Ing. Igor Lacík, DrSc.		IN	Vec verejná – talk show Michala Tvarožku s I. Lacíkom, vedcom, riaditeľom Ústavu polymérov SAV	https://www.rtvs.sk/radio/archiv/1171/404813	14.2.2016
Ing. Igor Lacík, DrSc.		RO	Vec verejná – talk show Michala Tvarožku s I. Lacíkom, vedcom, riaditeľom Ústavu polymérov SAV	RTVS	14.2.2016
Ing. Igor Lacík, DrSc.		IN	Veda a technika – výrazný krok k riešeniu cukrovky	http://en.rsi.rtvs.sk/articles/science-and-technology/99615/researchers-take-a-bold-step-towards-solving-diabetes	10.2.2016
Ing. Igor Lacík, DrSc.		RO	Veda a technika – výrazný krok k riešeniu cukrovky	Slovak Radio International	10.2.2016
Mgr. Petra Mazancová		EX	Plasty medzi nami	Deň otvorených dverí, ÚPo SAV	10.11.2016
Mgr. Petra Mazancová		PB	Plasty medzi nami	Deň otvorených dverí, ÚPo SAV	10.11.2016
Mgr. Veronika Némethová		IN	Nemeth Veronika szlovakia diakszemelyisege	http://m.ujszo.com/online/regio/2016/12/14/nemeth-veronika-szlovakia-diakszemelyisege	14.12.2016
Mgr. Veronika Némethová		TL	Nemeth Veronika szlovakia diakszemelyisege	UJSZÓ	14.12.2016
Mgr. Veronika Némethová		PB	Plasty medzi nami	Deň otvorených dverí, ÚPo SAV	10.11.2016
Mgr. Veronika Némethová		EX	Plasty medzi nami	Deň otvorených dverí, ÚPo SAV	10.11.2016

Mgr. Veronika Némethová		IN	Študentská osobnosť Slovenska	http://www.teraz.sk/fotodennik/studentska-osobnost-slovenska/188470-fotografia.html#/fotodennik/fotografia/188466	14.12.2016
Mgr. Veronika Némethová		IN	Top študentskou osobnosťou je vedkyňa, ktorá sa snaží bojovať proti rakovine	https://www.tvnoviny.sk/zaujimavosti/1851393_top-studentskou-osohttps://www.tvnoviny.sk/zaujimavosti/1851393_top-studentskou-osobnostou-je-vedkyna-kto	14.12.2016
Mgr. Veronika Némethová		TV	Top študentskou osobnosťou je vedkyňa, ktorá sa snaží bojovať proti rakovine	STV 1	14.12.2016
Mgr. Veronika Némethová		IN	Top študentskou osobnosťou je vedkyňa, ktorá sa zameriava na boj s rakovinou	http://www.ta3.com/clanok/1096189/top-studentskou-osobnostou-je-vedkyna-ktora-sa-zameriava-na-boj-s-rakovinou.html	14.12.2016
Mgr. Veronika Némethová		TV	Top študentskou osobnosťou je vedkyňa, ktorá sa zameriava na boj s rakovinou	TA 3	14.12.2016
Ing. Igor Novák, PhD.		PB	Vplyv modifikácie polymérnych materiálov účinkom nízkoteplotnej plazmy na adhézne vlastnosti-2 hodiny (1 prednáška)	ZF Slovakia, a.s., Trnava	3.5.2016
Ing. Filip Rázga, PhD.		PB	Plasty medzi nami	Deň otvorených dverí, ÚPo SAV	10.11.2016
Ing. Filip Rázga, PhD.		EX	Plasty medzi nami	Deň otvorených dverí, ÚPo SAV	10.11.2016
Ing. Filip Rázga, PhD.	Némethová Veronika, Kleščíková Lucia, Záhoranová Anna	PB	Plasty medzi nami	Európska noc výskumníka – 10. ročník, stánok ÚPo SAV pre verejnosť, Stará tržnica	30.9.2016
Ing. Lucia Rišpanová		PB	Zasimulujme si	Deň otvorených dverí, ÚPo SAV	10.11.2016
Ing. Lucia Rišpanová		EX	Zasimulujme si	Deň otvorených dverí, ÚPo SAV	10.11.2016
Ing. Alena Šišková, PhD.		IN	Plast nemusí končiť na skládke, Slovenky z neho robia šperky	SME Tech http://tech.sme.sk/c/20414201/plast-nemusi-koncit-na-skladke-slovenky-z-neho-robia-sperky.html	19.12.2016
Ing. Alena Šišková, PhD.	Švajdlenková Helena	PB	Polyméry okolo nás	Európska noc výskumníka – 10. ročník, stánok ÚPo SAV pre verejnosť, Stará tržnica	30.9.2016
Ing. Alena Šišková, PhD.	Švajdlenková Helena	EX	Polyméry okolo nás	Európska noc výskumníka – 10. ročník, stánok ÚPo SAV pre verejnosť, Stará tržnica	30.9.2016

Mgr. Petra Šrámková		PB	Plasty medzi nami	Deň otvorených dverí, ÚPo SAV	10.11.2016
Mgr. Petra Šrámková		EX	Plasty medzi nami	Deň otvorených dverí, ÚPo SAV	10.11.2016
Ing. Helena Švajdlenková, PhD.	Šišková Alena	PB	Polyméry okolo nás	Deň otvorených dverí, ÚPo SAV	10.11.2016
Ing. Helena Švajdlenková, PhD.	Šišková Alena	EX	Polyméry okolo nás	Deň otvorených dverí, ÚPo SAV	10.11.2016
Mgr. Anna Zahoranová, PhD.		PB	Plasty medzi nami	Deň otvorených dverí, ÚPo SAV	10.11.2016
Mgr. Anna Zahoranová, PhD.		EX	Plasty medzi nami	Deň otvorených dverí, ÚPo SAV	10.11.2016
Mgr. Anna Zahoranová, PhD.	Kleščíková Lucia	PB	Plasty medzi nami	Európska noc výskumníka – 10. ročník, stánok ÚPo SAV pre verejnosť, Stará tržnica	30.9.2016
Ing. Igor Lacík, DrSc.		TL	Enkapsulácia pankrea-tických ostrovčekov pre kontrolu hladiny cukru: súčasný stav.	Diabetik 1-2, 2016	6
Ing. Igor Lacík, DrSc.		TL	Veda v centre – Progre- sívna liečba cukrovky	Quark 2/2016, p. 38	12
Ing. Igor Novák, PhD.	Žigo Ondrej	TL	Využitie materiálov na báze syntetických polymérov pri výrobe automobilov.	Plastics Productions, 2016, roč. 11, č. 1, s. 56-57. ISSN 1802-1549.	1
Ing. Igor Novák, PhD.	Žigo Ondrej, Valentín Marian	TL	Aplikácia polymérov a využitie lepenia pri výro-be automobilov pri súčas -nej výrobe automobilov.	Automobil Industry, 2015, roč. XI, č. 3, s. 82-84. ISSN 1802-5196.	1
Mgr. Zdenko Špitálsky, PhD.	Nógellová Zuzana, Žigo Ondrej, Janigová Ivica, Kováčová Mária, Krupa Igor	TL	Materiály s fázovou pre- menou na báze vysoko-hustotného polyetylénu plnené mikroenkapsulo-vaným parafínovým vos- kom pre aplikácie v staviteľskom inžinierstve.	TechCON, 2016, roč. 12, č. 2, s. 25-28. ISSN 1337-3013.	1

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

9.1.2. Súhrnné počty vedecko-popularizačných činností organizácie SAV

Tabuľka 9b Súhrnné počty vedecko-popularizačných činností organizácie SAV

Typ	Počet	Typ	Počet	Typ	Počet
prednášky/besedy	19	tlač	7	TV	6
rozhlas	2	internet	11	exkurzie	10
publikácie	0	multimediálne nosiče	0	dokumentárne filmy	1
iné	0				

9.2. Vedecko-organizačná činnosť

Tabuľka 9c Vedecko-organizačná činnosť

Názov podujatia	Domáca/ medzinárodná	Miesto	Dátum konania	Počet účastníkov
BYPoS 2016 – Bratislava Young Polymer Scientists workshop	medzinárodná	Hotel Bachledka, Ždiar	14.03.-18.03.2016	46
New trends in solar cells and WG and MC meeting of COST MP 1307	medzinárodná	Lindner Hotel Bratislava	19.04.-22.04.2016	75
IX. Slovensko-Česká konferencia Polyméry 2016	medzinárodná	Hotel Academia – KC Stará Lesná	08.06.-10.06.2016	70
BIMac 2016 - 22. Bratislavská konferencia o makromolekulách	medzinárodná	Hotel Holday Inn, Bratislava	06.09.-09.09.2016	60
2nd Meeting of ABIOG project partners & Workshop	medzinárodná	Ústav polymérov SAV, Bratislava	15.11.-16.11.2016	30

9.3. Účasť na výstavách

Názov výstavy: TEXTILE ART OF TODAY, medzinárodná putovná výstava súčasnej umeleckej textilnej tvorby pod záštitou ministrov kultúry krajín V4.
Miesto konania: Poprad
Dátum: 02.2016
Zhodnotenie účasti: Poprad (február – marec 2016), Bialsko-Biała (máj – august 2016), Györ (september – október 2016), Uherské Hradište (november 2016 – január 2017) II) 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: 43. medzinárodná poľnohospodárska a potravinárska výstava Agrokomplex 2016
Miesto konania: Stánok SAV, výstavisko Agrokomplex, Nitra
Dátum: 08.2016
Zhodnotenie účasti: Aktívna účasť na výstavách a veľtrhoch za účelom inštalácie a propagácie špeciálnych adhezív z Ústavu polymérov v rámci expozície SAV (zodpovední pracovníci - Novák Igor, Žigo Ondrej)

Názov výstavy: 37. medzinárodný veľtrh Coneco 2016
Miesto konania: Stánok SAV, výstavisko Incheba Expo, Bratislava
Dátum: 4.2016
Zhodnotenie účasti: Aktívna účasť na výstavách a veľtrhoch za účelom inštalácie a propagácie špeciálnych adhezív z Ústavu polymérov v rámci expozície SAV (zodpovední pracovníci - Novák Igor, Žigo Ondrej)

Názov výstavy: 23. medzinárodný veľtrh strojov, nástrojov, zariadení a technológií
Miesto konania: Stánok Slovenskej zváračskej spoločnosti, výstavisko Agrokomplex, Nitra
Dátum: 5.2016
Zhodnotenie účasti: Aktívna účasť na výstavách a veľtrhoch za účelom inštalácie a propagácie špeciálnych adhezív z Ústavu polymérov v rámci expozície SAV (zodpovední pracovníci - Novák Igor, Žigo Ondrej)

Názov výstavy: Výstava NANO-Art
Miesto konania: Ústav polymérov SAV, Bratislava
Dátum: 1.11.2016
Zhodnotenie účasti: II)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)

9.4. Účasť v programových a organizačných výboroch národných konferencií

Tabuľka 9d Programové a organizačné výbory národných konferencií

Typ výboru	Programový	Organizačný	Programový i organizačný
Počet členstiev	3	4	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.

Plasty a kaučuk (ČR) (funkcia: člen edičnej rady)
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 Polyméry a 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)
SCHS (funkcia: podpredsedníčka)

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

V r. 2016 Ústav polymérov SAV organizoval jedno národné a štyry medzinárodné vedecké podujatia:

- 6th Bratislava Young Polymer Scientists Workshop BYPoS, 14. – 16. marec 2016, Ždiar
- New Trends in Solar Cells, 19. – 22. apríl 2016, Bratislava
- IX. Slovensko-česká konferencia o polyméroch – POLYMÉRY 2016, 8. – 10. jún 2016, Bratislava
- 22nd Bratislava International Conference on Macromolecules – BIMAC 2016, 6. – 9. september 2016, Bratislava
- 2nd Meeting of ABIOG project partners & Workshop, 15. – 16. november 2016, Bratislava

Ústav polymérov SAV pokladá za významné vedecko-popularizačné aktivity v rôznych médiách v zmysle súčasných trendov SAV. Propagácia sa v roku 2016 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 a laickou verejnosťou. Ústav polymérov SAV bol zviditeľnený i vďaka Krištáľovému krídlu udelenému Ing. Igorovi Lacíkovi, DrSc., cene Literárneho fondu prof. RNDr. Ignácovi Capekovi, DrSc. a Ing. Márii Omastovej, DrSc. a zlatej medaily SAV prof. Ing. Borsigovi Ebergardovi, DrSc. Medzi ocenenými bola v roku 2016 i študentka doktorandského štúdia Ing. Veronika Némethová, ktorá sa stala absolútnou laureátkou národnej súťaže Študentská osobnosť roka Slovenska.
V spolupráci s chemickou firmou BASF Slovensko je ústav i spolupropagátorom akcie Future city (http://chemgeneration.com/sk/futurecity.html), ktorej cieľom je stimulovať mladú generáciu k štúdiu chémie. 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		**8 145**
z toho	knihy a zviazané periodiká	**8 145**
	audiovizuálne dokumenty	**0**
	elektronické dokumenty (vrátane digitálnych)	**0**
	mikroformy	**0**
	iné špeciálne dokumenty - dizertácie, výskumné správy	**148**
Počet titulov dochádzajúcich periodík		**3**
z toho zahraničné periodiká		**1**
Ročný prírastok knižničných jednotiek		**4**
v tom	kúpou	**2**
	darom	**2**
	výmenou	**0**
	bezodplatným prevodom	**0**
Úbytky knižničných jednotiek		**2 828**
Knižničné jednotky spracované automatizovane		**0**

10.2. Výpožičky a služby

Tabuľka 10b Výpožičky a služby

Výpožičky spolu		**767**
z toho	odborná literatúra pre dospelých	**681**
	výpožičky periodík	**86**
	prezenčné výpožičky	**0**
MVS iným knižniciam		**4**
MVS z iných knižníc		**0**
MMVS iným knižniciam		**0**
MMVS z iných knižníc		**0**
Počet vypracovaných bibliografií		**0**
Počet vypracovaných rešerší		**205**

10.3. Používatelia

Tabuľka 10c Používatelia

Registrovaní používatelia	**52**
Návštevníci knižnice spolu (bez návštevníkov podujatí)	**150**

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 €	**748.27**

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 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)

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 31.12.2016 spolu	v tom:			
		zo ŠR od zriaďovateľa	z vlastných zdrojov	z iných zdrojov	z toho: ŠF EÚ
Výdavky spolu	**2 308 948**	**1 391 933**			
Bežné výdavky	**2 167 285**	**1 349 853**	**160 899**	**499 856**	**73 246**
v tom:					
mzdy (610)	**989 044**	**757 945**	**85 103**	**145 996**	**46 701**
poistné a príspevok do poisťovní (620)	**336 576**	**261 533**	**27 488**	**47 554**	**16 324**
tovary a služby (630)	**607 570**	**252 956**	**48 308**	**306 306**	**10 221**
z toho: časopisy					
VEGA projekty	**120 022**	**120 022**			
MVTS projekty	**74 181**	**74 181**			
CE	**0**	**0**			
vedecká výchova	**4 760**	**4 760**			
bežné transfery (640)	**234 104**	**77 419**	**1 440**	**155 245**	
z toho: štipendiá	**78 859**	**77 419**	**1 440**		
transfery partnerom projektov	**153 270**			**82 763**	
Kapitálové výdavky	**141 663**	**42 080**	**37 460**		
v tom:					
obstarávanie kapitálových aktív	**37 460**		**37 460**		
kapitálové transfery	**104 203**	**42 080**			
z toho: transfery partnerom projektov					

12.2. Príjmy PO SAV

Tabuľka 12b Príjmy PO SAV (v €)

P r í j m y	**Skutočnosť k 31.12.2016 spolu**	**v tom:**	
		rozpočtové	**z mimorozp. zdrojov**
Príjmy spolu	**2 349 769**	**1 391 933**	**957 836**
Nedaňové príjmy	**2 349 769**	**1 391 933**	**957 836**
v tom:			
príjmy z prenájmu	**24 623**		**24 623**
príjmy z predaja výrobkov a služieb	**280 423**		**280 423**
iné	**652 790**		**652 790**
Granty a transfery (mimo zdroja 111)	**534 920**		**534 920**
v tom:			
tuzemské	**458 116**		**458 116**
z toho: APVV	**457 561**		**457 561**
iné	**555**		**555**
zahraničné	**76 804**		**76 804**
z toho: projekty rámcového programu EÚ			
iné	**76 804**		**76 804**

13. Nadácie a fondy pri organizácii SAV

Názov: Neinvestičný fond Cukrovka n.f. (www.cukrovkanf.sk)
Zame ranie: 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 vzdelávania 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

15. Vyznamenania, ocenenia a ceny udelené pracovníkom organizácie v roku 2016

15.1. Domáce ocenenia

15.1.1. Ocenenia SAV

Borsig Eberhard
Zlatá medaila SAV
Oceňovateľ: Predsedníctvo SAV
Opis: Ocenenie, ktoré menovanému dňa 19.10.2016 udelilo P SAV za dlhoročnú vedeckú prácu v oblasti vedy o polyméroch.

15.1.2. Iné domáce ocenenia

Capek Ignác
cena Literárneho fondu za vedeckú a odbornú literatúru za rok 2015
Oceňovateľ: Literárny fond
Opis: cena za vedeckú a odbornú literatúru za rok 2015 v kategórii prírodné a technické vedy za dielo DNA Engineered Noble Metal Nanoparticles: Fundamentals and State-of-the-Art of Nanobiotechnology (vyd. Wiley&Sons, Scrivener Publishing, USA

Lacík Igor
Laureát 19. ročníka Krištaľového krídla v kategórii Medicína a veda za rok 2015
Oceňovateľ: Agentúra Krištáľové krílo s. r. o.
Opis: Ocenenie v kategórii Medicína a veda za rok 2015, konaného pod záštitou predsedu Národnej rady SR p. Petra Pellegriniho, Slovenské národné divadlo, 24.01.2016

Némethová Veronika
Študentská osobnosť roka Slovenska za akademický rok 2015/2016
Oceňovateľ: Junior Chamber International – Slovakia
Opis: Absolútna laureátka dvanásteho ročníka národnej súťaže Študentská osobnosť roka Slovenska za akademický rok 2015/2016, ktorú organizuje Junior Chamber International – Slovakia. Projekt sa uskutočňuje so záštitou prezidenta SR a jeho garantmi sú Rektorská konferencia Slovenska a Slovenská akadémia vied.

Omastová Mária
Prémia Literárneho fondu
Oceňovateľ: Literárny fond
Opis: II. miesto za trojročný vedecký ohlas za rok 2015 v kategórii technické vedy a geovedy

15.2. Medzinárodné ocenenia

Omastová Mária
Čestné členstvo v České společnosti chemické
Oceňovateľ: Česká společnost chemická
Opis: Čestné členstvo v České společnosti chemické udelené na 68. Zjazde Chemických spoločností, Praha, September 2016

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. 2016 pretrvávali nejasnosti ohľadne postupu k plánovanej transformácii inštitúcií SAV na verejno-výskumné inštitúcie spojené aj s reštrukturalizáciou. V priebehu roka bola však vládou transformácia SAV pozastavená. Vedenie ústavu podporuje transformáciu a veríme, že sa ju čoskoro v najbližších rokoch podarí uskutočniť.
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 2016 na dobu minimálne 1 mesiaca až 8 postdoktorandov alebo študentov z rôznych krajín sveta, ale i s finančných rezerv ústavu, ktoré v roku 2016 pokryli pobyty 2 postdokov z Českej republiky. Tak ako už niekoľkokrát v minulosti i v roku 2016 sme však 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 31.12.2016

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.	50	0.50
3.	RNDr. Peter Cifra, DrSc.	100	1.00
4.	Štefan Chmela, DrSc.	100	1.00
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.	50	0.50
9.	Ing. Jozef Rychlý, DrSc.	30	0.30
Samostatní vedeckí pracovníci			
1.	Mgr. Zuzana Benková, PhD.	100	1.00
2.	Mgr. Martin Danko, PhD.	100	1.00
3.	Ing. Anita Eckstein, PhD.	100	0.83
4.	Ing. Ivica Janigová, PhD.	100	1.00
5.	Mgr. Jozef Kollár, PhD.	100	1.00
6.	Mgr. Juraj Kronek, PhD.	100	1.00
7.	Mgr. Zuzana Kroneková, PhD.	100	1.00
8.	Ing. Matej Mičušík, PhD.	100	1.00
9.	Ing. Igor Novák, PhD.	100	1.00
10.	Ing. Dušan Račko, PhD.	100	0.00
11.	Ing. Filip Rázga, PhD.	105	1.08
12.	Mgr. Zdenko Špitálsky, PhD.	100	1.00
Vedeckí pracovníci			
1.	RNDr. Dmitrij Bondarev, PhD.	100	0.50
2.	Ing. Katarína Borská, PhD.	100	1.00
3.	Ing. Gabriela Hloušková, PhD.	100	0.00
4.	Ing. Markéta Ilčíková, PhD.	100	0.00
5.	Ing. Daniela Jochec Mošková, PhD.	60	0.65
6.	Ing. Lucia Kleščíková, PhD.	100	1.00
7.	Ing. Miroslava Lukešová, PhD.	100	0.66
8.	Ing. Marta Malíková, PhD.	50	0.17
9.	Mgr. Zoran Markovic, PhD.	100	1.00
10.	Ing. Daniela Moravčíková, PhD.	100	1.00

11.	Mgr. Katarína Mosnáčková, PhD.	100	0.50
12.	Mgr. Kristián Peptu, PhD.	100	1.00
13.	Mgr. Silvia Podhradská, PhD.	100	1.00
14.	RNDr. Michal Procházka, PhD.	100	1.00
15.	Mgr. Vladimír Raus, PhD.	100	0.75
16.	Ing. Michaela Sedničková, PhD.	100	1.00
17.	Ing. Alena Šišková, PhD.	100	1.00
18.	Ing. Helena Švajdlenková, PhD.	100	1.00
19.	Ing. Dušana Treľová, PhD.	100	1.00
20.	Ing. Lucia Uhelská, PhD.	100	0.69
21.	Mgr. Anna Zahoranová, PhD.	100	0.40
Odborní pracovníci s VŠ vzdelaním (výskumní a vývojoví zamestnanci)			
1.	Ing. Róbert Balogh	100	0.33
2.	Mgr. Rastislav Baran	5	0.35
3.	Ing. Nikola Bugárová	10	0.10
4.	Ing. Zuzana Cseriová	100	1.00
5.	Ing. Katarína Csomorová	100	1.00
6.	Ing. Eliška Číková	10	0.10
7.	RNDr. Agnesa Fiedlerová	100	1.00
8.	Ing. Zuzana Hloušková	100	1.00
9.	Ing. Ana Hološ	10	0.70
10.	Ing. Ľudmila Hrčková	80	0.80
11.	Ing. Anna Chovancová	100	0.40
12.	Ing. František Ivanič	10	0.10
13.	Ing. Angela Kleinová	100	1.00
14.	Mgr. Igor Koreň	20	0.20
15.	Mgr. Mária Kováčová	10	0.03
16.	Ing. Jaroslav Kuliček	10	0.10
17.	Ing. Eva Macová	100	1.00
18.	Mgr. Petra Mazancová	10	0.10
19.	Mgr. Veronika Némethová	10	0.10
20.	Ing. Zuzana Nógellová	100	1.00
21.	Ing. Nadežda Petrenčíková	80	0.90
22.	Mgr. Jozef Prachár	20	0.14
23.	Ing. Lucia Rišpanová	10	0.03
24.	Ing. Mária Šivová	100	1.00
25.	Mgr. Petra Šrámková	10	0.10
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.	Katarína Cinová	100	1.00
2.	Nadežda Danková	100	1.00
3.	Eva Hipká	100	1.00
4.	Ivona Hrodeková	100	1.00
5.	Sidónia Kalinová	100	1.00
6.	Jozef Kandráč	80	0.80
7.	Viera Karlíková	100	1.00
8.	Marcela Kimličková	100	1.00
9.	Zuzana Kuželová	100	1.00
10.	Marta Mitošinková	100	1.00
11.	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**
Vedeckí pracovníci			
1.	Ing. Klaudia Forró, PhD.	31.10.2016	0.43
2.	Ing. Andrea Mihálová, PhD.	31.8.2016	0.47
3.	Ing. Marian Valentin, PhD.	30.6.2016	0.05
Odborní pracovníci s VŠ vzdelaním (výskumní a vývojoví zamestnanci)			
1.	Ing. Dominika Hlásna	31.8.2016	0.66

Zoznam doktorandov

	Meno s titulmi	**Škola/fakulta**	**Študijný odbor**
Interní doktorandi hradení z prostriedkov SAV			
1.	Ing. Nikola Bugárová	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia
2.	Ing. Eliška Číková	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia
3.	Ing. Ana Hološ	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia
4.	Ing. Anna Chovancová	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia
5.	Ing. František Ivanič	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia
6.	Mgr. Mária Kováčová	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia

7.	Ing. Jaroslav Kuliček	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia
8.	Mgr. Petra Mazancová	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia
9.	Ing. Veronika Némethová	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia
10.	Mgr. Jozef Prachár	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia
11.	Ing. Lucia Rišpanová	Fakulta chemickej a potravinárskej technológie STU	4.1.19 makromolekulová chémia
12.	Mgr. Petra Šrámková	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 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 Lazar, 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:	1.1.2016 / 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 Ɛ-kaprolaktónu a α-metylén-ϒ-butyrolaktónu (P(MBL-co-CL), ktorých násobná väzba pozdĺž reťazca dovoľuje ich modifikáciu. Pokračovalo sa v experimentoch kopolymerizácie MBL s α-CL v podmienkach ROP iniciáciou Al(OiPr)3 pri rôznych teplotách. Štúdie ROP potvrdili vznik polyméru s Mn = 20 000-45 000 gmol-1 s pomerne nízkym koeficientom disperzity (? = 1.15-1.30) s vyšším obsahom MBL v kopolyméri pri nižšej teplote pre daný pomer monomérov. Je to v súlade s termodynamicky stanovenou rovnovážnou koncentráciou MBL monoméru, ktorá sa znižuje s klesajúcou teplotou a tým sa zvyšuje obsah otvoreného laktónu v P(MBL-co-CL) polyesteri. Následne sa uskutočnili modelové modifikácie pomocou tiolénovej reakcie v miernych podmienkach fotoaktivácie, ktoré potvrdili funkčnosť polyeteru a zároveň ukázali možnosť tvorby supramolekulových štruktúr po modifikácií s derivátom kyseliny jantárovej.

Výstupy:

1. DANKO, Martin - *ĎURKÁČOVÁ, Slávka* - MOSNÁČEK, Jaroslav. Functional copolyesters of alpha-methylene-gamma butyrolactone with epsilon-caprolactone. In POC16 : 16th International Conference on Polymers and Organic Chemistry : book of abstracts. - Hersonissos, Crete : University of Crete, 2016, p. 72. ISBN 978-960-9430-14-2

2. DANKO, Martin - *ĎURKÁČOVÁ, Slávka* - MOSNÁČEK, Jaroslav. Copolymers of alpha-methylene-gamma-butyrolactone with epsilon-caprolactone bearing functional double bonds. In Polyméry 2016 : IX. Slovensko - Česká konferencia : program a zborník príspevkov. - Bratislava : Ústav polymérov SAV, 2016, s. 15-16. ISBN 978-80-89841-00-4.

3. DANKO, Martin - *ĎURKÁČOVÁ, Slávka* - MOSNÁČEK, Jaroslav. Copolyester of epsilon-caprolactone with alpha-methylene-gamma-butyrolactone bearing double bond functionality. In BIMac 2016 : XXII. Bratislava Conference on Macromolecules : Polymers with Tailored Architecture and Properties : programme book and book of abstracts. - Bratislava : Ústav polymérov SAV, 2016, p. 31. ISBN 978-80-89841-01-1.

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

Zodpovedný riešiteľ:	Igor Novák
Trvanie projektu:	1.1.2014 / 31.12.2018
Evidenčné číslo projektu:	-
Organizácia je	áno

koordinátorom projektu:
Koordinátor: Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií: 1 - Česko: 1
Čerpané financie: mobilita

Dosiahnuté výsledky:

Boli študované povrchové a adhézne vlastnosti metalocénových polyolefínov bez úpravy a po úprave nízkoteplotnou bariérovou plazmou. Skúmala sa povrchová energia metalocénových polyolefínov a jej polárna zložka ako aj adhézia metalocénových polyolefínov modifikovaných plazmou ku polárnejším substrátom. Potvrdil sa významný nárast pevnosti adhéznych spojov metalocénových polymérov aplikovaných vo forme tavných adhezív po úprave nízkoteplotnou plazmou.

Výstupy:

1. MATYAŠOVSKÝ, J. - SEDLIAČIK, J. - NOVÁK, Igor - ŠIMON, P. - JURKOVIČ, P.- DUCHOVIČ, P. - KLEINOVÁ, Angela. Modified smart collagen biomaterials for pharmacy and adhesive application. In The Journal of the American Leather Chemists Association, 2016, vol. 111, no. 10, p. 365-376. (0.707 - IF2015). ISSN 0002-9726.

2. FLORIÁN, Štepán - NOVÁK, Igor - ŽIGO, Ondrej. Štúdium vlastností špeciálnych adhezív = Investigation of special adhesives properties. In Sborník IX. konference Pigmenty a pojiva. - Pardubice, ČR : Chemagazín, 2016, p. 47 - 49. ISBN 978-80-906269-1-1.

3. MATYAŠOVSKÝ, J. - SEDLIAČIK, J. - *NOVÁK, Igor* - JURKOVIČ, P. - DUCHOVIČ, P. Collagen biomaterial as a modifier of thermoplastic adhesive. In Annals of Warsaw University of Life Sciences - SGGW : Forestry and Wood Technology, 2016, no. 95, p. 258-263. ISSN 1898-5912.

3.) Príprava a elektrické vlastnosti vodivých polymérnych kompozitov a nanokompozitov. *(Preparation and electrical properties of conducting polymer composites and nanocomposites.)*

Zodpovedný riešiteľ: Mária Omastová
Trvanie projektu: 1.1.2012 / 31.12.2016
Evidenčné číslo projektu: -
Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií: 1 - Česko: 1
Čerpané financie: mobilita

Dosiahnuté výsledky:

Mnohostenné uhlíkové nanotrubičky (MWCNT) sa modifikovali použitím chemickej oxidačnej polymerizácie anilínu. Pripravené kompozitné materiály obsahovali od 10 do 70 hm.% vodivého polyméru – polyanilínu. Hybridné materiály s obsahom polyanilínu nad 50 hm.% dosiahli veľmi dobré výsledky pri testovaní ako chemické senzory amoniaku.

4.) 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: 1.1.2016 / 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:
V hodnotenom období sme spolupracovali na výbere najvhodnejších mechanizmov separácie. Pomocou gradientovej HPLC sme získali informácie o zložení eluentu, pri ktorom eluujú jednotlivé zložky vzorky. Následným krokom bude nájsť bariery pri separácii pomocou LC LC metódy.

Programy: COST

5.) 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: 1.4.2016 / 30.4.2020
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: 2625 €
Dosiahnuté výsledky:
Pripravili sme PVDF kompozity s MWCNT dekorovanými s Fe nanočasticami. Použili sme dva typy plniva, MWCNT s obsahom 35 % Fe a 20 % Fe. Celková koncentrácia plniva bola 1.5 a 3 hm.%. Vylisovali sa krúžky s hrúbkou 0.2 mm a priemerom 2.5 cm. Zmerali sme aj chemické zloženie povrchu pomocou XPS pre MWCNT s rôznym obsahom Fe od 10-35 hm.%. PVDF/MWCNT-Fe kompozity boli poslané spoluriešiteľom v Litve (Vilniuská univerzita, Fyzikálna fakulta), kde sa dané materiály budú testovať pomocou dielektrickej relaxačnej spektroskopie a bude sa určovať ich piezoelektrická odozva.

Výstupy:

1. MIČUŠÍK, Matej - GEORGOUIS, G. - PANDIS, C. -KALAMIOTIS, A. - GEORGIOPOULOS, P.- KYRITSIS, A. - KONTOU, E. - PISSIS, P. - *CZANIKOVÁ, Klaudia* - KULIČEK, Jaroslav - OMASTOVÁ, Mária. Strain sensing in polymer/carbon nanotube composites by electrical resistance measurement. In Multi-Functional Nano-Carbon Composite Materials, October 19-20, 2016, Heraklion, Crete. Poster

6.) Dlhodobo udržateľné retardanty horenia pre textil a príbuzné materiály na báze nanočastíc nahradzujúcich konvenčné chemické látky *(Sustainable flame retardancy for textiles and related materials based on nanoparticles substituting conventional chemicals)*

Zodpovedný riešiteľ: Mária Omastová
Trvanie projektu: 1.5.2012 / 31.5.2016
Evidenčné číslo projektu: MP1105
Organizácia je koordinátorom projektu: nie
Koordinátor: Ghent University/Department of Textiles, 9052 Zwijnaarde (Gent), Belgicko

Počet spoluriešiteľských inštitúcií:	19 - Fínsko: 2, Francúzsko: 2, Veľká Británia: 3, Taliansko: 3, Litva: 3, Poľsko: 2, Portugalsko: 4
Čerpané financie:	Podpora medzinárodnej spolupráce z národných zdrojov: 1458 €

Dosiahnuté výsledky:

Počas riešenia projektu sme sa pokúsili o aplikáciu vodivej povrchovej vrstvy na textílie súčasne s protihorľavou vrstvou, výsledky však ukázali, že ak posledným krokom je nanášanie protihorľavej vrstvy, výrazne sa znižuje elektrická vodivosť textílie. Výsledky meraní na kónickom kalorimetri ukázali, že parametre ako čas do vznietenia, rýchlosť uvoľňovania tepla, celková spotreba kyslíka a pod. boli výrazne znížené, teda horľavosť materiálu bola potlačená, vzhľadom na materiál bez aplikácie protihorľavej vrstvy.

7.) Nové materiály a zariadenia na báze vodivých polymérov a ich kompozitov – Etapa 2. *(New materials and devices based on conducting polymers and their composites.)*

Zodpovedný riešiteľ:	Mária Omastová
Trvanie projektu:	1.9.2015 / 31.1.2016
Evidenčné číslo projektu:	MVTS - COST Polycon01DS15015
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Brandenburg University of Technology Cottbus–Senftenberg
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	Podpora medzinárodnej spolupráce z národných zdrojov: 292 €

Dosiahnuté výsledky:

Počas posledného obdobia trvania projektu sa pripravoval návrh projektu Horizont 2020 s názvom Electrically Passive Polymer Composites Doped With Nano- and Microfillers, Work Programme Part: Marie Skłodowska-Curie Actions.

8.) 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:	1.2.2015 / 31.3.2018
Evidenčné číslo projektu:	MVTS - COST MP 1307
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Fundaci Institut Catal De Nanocicia I Nanotecnologia, Barcelona
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	Podpora medzinárodnej spolupráce z národných zdrojov: 3500 €

Dosiahnuté výsledky:

Pokračovali sme na príprave protielektród do solárnych článkov, ktoré sú založené na hybridných elektricky vodivých kompozitných materiálov na báze uhlíkových nanočastíc a vodivých polymérov. Počas uplynulého obdobia sme pokračovali na príprave hybridných materiálov chemickou oxidačnou polymericáciou pyrolu a nové nanokompozity sa pripravovali elektrochemicky, priamou polymerizáciou PPy na povrch FTO (Fluorine doped Tin Oxide) skla. Zaoberali sme sa aj charakterizáciu povrchov materiálov pomocou rontgenovej fotoelektrónovej spektroskopie (XPS) a riadkovacej elektrónovej mikroskopie.

Výstupy:

1. KULIČEK, Jaroslav - GEMEINER, P. - MIČUŠÍK, Matej - ŠVORC, Ľ. - OMASTOVÁ, Mária.

Comparison of chemical and electrochemical preparation of polypyrrole/multiwall carbon nanotube nanocomposites for solar cells application. In Czech Chemical Society Symposium Series, 2016, roč. 14, č. 5, s. 260-261. ISSN 2336-7202.

2. KULIČEK, Jaroslav - GEMEINER, P. - MIČUŠÍK, Matej - ŠVORC, Ľ. - MIKULA, M. - OMASTOVÁ, Mária. Carbon nanotubes/polypyrrole nanocomposites in the solar cells applications. In ICSM 2016 : the 24th International Conference on Science and Technology of Synthetic Metals. - Guangzhou, China : South China University of Technology, 2016, abstract no. M-2-14.

3. KULIČEK, Jaroslav - MIČUŠÍK, Matej - GEMEINER, P. - MIKULA, M. - OKSUZ, A. U. - OMASTOVÁ, Mária. Polypyrrole/carbon nanotubes composites as counter electrodes in solar cells. In 1st Conference of Organic & Perovskite Solar Cells and 6th MC/WG meeting of Cost Action MP1307 : programme and book of abstracts. - Heraklion, Crete : Nano Group of TEI of Crete, 2016, p.42. Dostupné na internete: <solar.teicrete.gr>.

4. MIČUŠÍK, Matej - KULIČEK, Jaroslav - PODHRADSKÁ, Silvia - GEMEINER, P. - MIKULA, M. - ŠVORC, Ľ. - OMASTOVÁ, Mária. Preparation and characterization of multiwall carbon nanotubes/polypyrrole nanocomposites for solar cells application. In New Trends in Solar Cells : book of abstracts. - Bratislava : Polymer Institute of SAS, 2016, p. 113-114. ISBN 978-80-970923-9-9.

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

Zodpovedný riešiteľ:	Alena Šišková
Trvanie projektu:	1.5.2013 / 31.5.2017
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: 3500 €

Dosiahnuté výsledky:

V hodnotenom období sa charakterizovali modifikované vlákenné vrstvy pripravené elektrostatickým zvlákňovaním z vodného roztoku PVA, optimalizovali sa podmienky zvlákňovania celulózy z IL a tiež zo zmesí IL s DMF, DMSO, ktoré sa následne modifikovali alkylovaným pesticídom. Pripravené produkty sa charakterizovali z hľadiska mechanických a tepelných vlastností. Študovala sa kinetika uvoľňovania z fyzikálne modifikovaných produktov. Zistilo sa, že tepelné a mechanické vlastnosti PVA nie sú výrazne ovplyvnené chemickou modifikáciou avšak v prípade celulózy už pri rozpúšťaní v IL dochádza k zmene kryštalinity celulózy a preto aj k zmene študovaných vlastností.

Výstupy:

1. ŠIŠKOVÁ, Alena - ECKSTEIN ANDICSOVÁ, Anita. Functional modification of cellulose for controlled release systems. In Cellulosic material properties and industrial potentia : 23-14 April, 2016: scientific programm and book of abstract. - Stockholm, Sweden: SP Technical Research Institute of Sweden, 2016, non p. ISBN 978-91-88349-50-7. Prednáška – Šišková

2. ŠIŠKOVÁ, Alena - RYCHTER, P. - OPÁLEK, A. - PORZIO, W. - KLEINOVÁ, A. - JANIGOVÁ, Ivica - ECKSTEIN ANDICSOVÁ, Anita. Cellulose-based controlled-release agrochemicals formulation. In Cellulosic Materials - Processing, Properties and Promising Applications: 22-23 September, 2016 Budapest, Hungary: abstract book. - Budapest, Hungary : Budapest University of Technology and Economics, 2016, p. 49-50.

3. ŠIŠKOVÁ, Alena - OPÁLEK, A. - MÚDRA, E. - KLEINOVÁ, Angela - JANIGOVÁ, Ivica - ECKSTEIN ANDICSOVÁ, Anita. Cellulose: controlled release system applied in agriculture. In N.I.C.E. 2016 : Nature Inspires, Creativity Engineers: 3rd International Conference on Bioinspired and Biobased Chemistry & Materials: 16-20. October, 2016, Nice, France: abstracts. - Nice, France: IUPAC, 2016, p. 275.

4. ŠIŠKOVÁ, Alena - RYCHTER, P. - OPÁLEK, A. - PORZIO, W. - KLEINOVÁ, Angela - JANIGOVÁ, Ivica - ECKSTEIN ANDICSOVÁ, Anita. Formulation and evaluation of cellulose-based controlled pesticides release systems. In BIMac 2016: XXII. Bratislava Conference on Macromolecules: Polymers with Tailored Architecture and Properties: 7-9 September, 2016, Bratislava: programme book and book of abstracts. - Bratislava: Ústav polymérov SAV, 2016, p. 63. ISBN 978-80-89841-01-1.

Programy: 7RP

10.) 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:	69 477.75 €

Dosiahnuté výsledky:

Pripravil sa elektrochemicky exfoliovaný grafén, ktorý nemá antibakteriálne vlastnosti, na rozdiel od grafénu exfoliovaného v prítomnsti kurkumínu. Zároveň sa pripravili polymérne kompozity s uhlíkovými kvantovými bodkami, ktoré tiež vykazujú antibakteriálny charakter.

Výstupy:

1. MARKOVIĆ, Zoran M. - BUDIMIR, M. D. - KEPIĆ, D. P. - HOLCLAJTNER-ANTUNOVIĆ, I. D. - MARINOVIĆ-CINCOVIĆ, M. T. - DRAMIĆANIN, M. D. - SPASOJEVIĆ, V. D. - PERUŠKO, D. B. - ŠPITÁLSKY, Zdenko - MIČUŠÍK, Matej - PAVLOVIĆ, V. B. - TODOROVIĆ-MARKOVIĆ, B. M. Semi-transparent, conductive thin films of electrochemical exfoliated graphene. In RSC Advances, 2016, vol. 6, p. 39275-39283. (3.289 - IF2015). ISSN 2046-2069.

2. TOSIC, D. - MARKOVIĆ, Zoran M. - JOVANOVIC, S. - PREKODRAVAC, J. - BUDIMIR, M. - KEPIC, D. - HOLCLAJTNER-ANTUNOVIC, I. - DRAMICANIN, M. - TODOROVIC-MARKOVIC, B. Rapid thermal annealing of nickel-carbon nanowires for graphene nanoribbons formation. In Synthetic Metals, 2016, vol. 218, p. 43-49. (2.299 - IF2015). ISSN 0379-6779.

3. PAUNOVIC, V. - RISTIC, B. - MARKOVIĆ, Zoran M. - TODOROVIC-MARKOVIĆ, B. - KOSIC, M. - PREKODRAVAC, J. - KRAVIC-STEVOVIC, T. - MARTINOVIC, T. - MIČUŠÍK, Matej - ŠPITÁLSKY, Zdenko - TRAJKOVIC, V. - HARHAJI-TRAJKOVIC, L. c-Jun N-terminal kinase-dependent apoptic phototoxicity of solvent exchange-prepared curcumin nanoparticles. In Biomedical Microdevices, 2016, vol. 18, art.no. 37. (2.227 - IF2015). ISSN 1387-2176.4.

11.) 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:	1.1.2016 / 31.12.2018
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: 54 162.06 €

Dosiahnuté výsledky:

Počas prvého roku riešenia projektu sa pripravili dobre definované deriváty cyklodextrínov na báze oligoesterov a oligokarbonátov nesúcich alkénovú skupinu polymerizáciou s otvorením kruhu cyklických esterov a karbonátov. Nadstavili sa reakčné podmienky polymerizácie a výsledné produkty boli analyzované novo vyvinutou analytickou technikou zahŕňajúcou kombináciu kvapalinovej chromatografie a hmotnostnej spektroskopie. Štruktúrna analýza bola doplnená NMR spektroskopiou. Tieto štúdie poskytli po prvý raz pohľad na presnú povahu funkcionalizácie cyklodextrínu ako základ pre pokročilú cyklodextrínom katalyzovanú polymerizáciu s otvorením kruhu cyklických monomérov.

Výstupy:

1. PEPTU, Christian - MOSNÁČEK, Jaroslav. Tandem mass spectrometry characterization of oligoester functionalized cyclodextrins. In BYPOS 2016 : 6th Bratislava Young Polymer Scientists Workshop : March 13th-18th, 2016 : High Tatras, Slovakia : workshop book. - Bratislava : Young Scientists Council of Polymer Institute of SAS, 2016, p. 109. ISBN 978-80-970923-8-2.

2. PEPTU, Cristian - MOSNÁČEK, Jaroslav. Mass spectrometry methods for polymer characterization - application to cyclodextrin tethered with aliphatic oligoesters. In BIMac 2016 : XXII. Bratislava Conference on Macromolecules : Polymers with Tailored Architecture and Properties : programme book and book of abstracts. - Bratislava : Ústav polymérov SAV, 2016, p. 34. ISBN 978-80-89841-01-1.

12.) 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: 1.4.2015 / 31.3.2018
Evidenčné číslo projektu: SASPRO 0057/01/02 (co-funded by Maria Curie Actions)
Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: 64 849.00 €

Dosiahnuté výsledky:

i) In silico dizajn pilotného systému, zahňujúci primárnu sekvenciu nukleotidovejkomponenty
ii) Syntéza stavebných blokov a ich oligomerizácia do vyšších oligomérov (nie však do finálnej dĺžky)
iii) Dizajn a štruktúrne varianty polymérnej komponenty
iv) Príprava niekoľkých štruktúrne odlišných telechelických polymérnych komponent plánovaných na konjugáciu
v) Dizajn a príprava liekového nosiča na báze chitozánu (pracuje sa na jeho stabilizácii pre využitie vo fyziologických podmienkach)
vi) Charakterizácia a in vitro testovanie liekových nosičov na báze magnetitu

Výstupy:

1. NÉMETHOVÁ, Veronika – RÁZGA, Filip Overexpression of ABCB1 as predicition marker for CML: How close we are to translation into clinics? Leukemia. 2017; vol. 31, p. 266-267

2. RÁZGA, Filip - *VNUKOVÁ, Dominika* - NÉMETHOVÁ, Veronika - MAZANCOVÁ, Petra - LACÍK, Igor. Preparation of chitosan-TPP-sub-micron particles: Critical evaluation and derived recommendations. In Carbohydrate Polymers, 2016, vol. 151, p. 488-499

3. NÉMETHOVÁ, Veronika – BULIAKOVÁ, B. – MAZANCOVÁ, Petra – BÁBELOVÁ, A – ŠELC, M – MORAVČÍKOVÁ, Daniela – KLEŠČÍKOVÁ, Lucia – URSÍNYOVÁ, M – GÁBELOVÁ, A – RÁZGA, Filip. Intracellular uptake of magnetite nanoparticles: a focus on physico-chemical characterization and interpretation of in vitro data. Mater Sci Eng C Mater Biol Appl. 2017; vol. 70, p. 161-168

4. RÁZGA, Filip – NÉMETHOVÁ, Veronika. Gene expression patterns as predictive biomarkers in hemato-oncology: Principal hurdles on the road to the clinic. Haematologica. 2016; vol. 102, p. e31-32

5. MAZANCOVÁ, Petra – NÉMETHOVÁ, Veronika – LACIK, Igor – RÁZGA Filip. Chitosan-based particles: The (forgotten) interplay between process, properties and performance. Mater Sci Eng C Mater Biol Appl. 2016; vol. 71, p. 570-571

6. 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. Nanomedicine. 2016; vol. 13, p. 69-82

7. RÁZGA, Filip – NÉMETHOVÁ, Veronika. A method for altering the functional state of any mRNA allowing its selective and specific recognition. PCT/SK2016/060002

8. ČERVINKA, P – RÁZGA, Filip – LACÍK, Igor. Droplet gun. Dokument 131/16

9. NÉMETHOVÁ, Veronika – LACÍK, Igor – RÁZGA, Filip. Vibration technology for cell encapsulation: Viscosity as the Achilles heel. Odoslané do Chemical papers. 2016

10. RÁZGA, Filip – NÉMETHOVÁ, Veronika. Prognostic value of ABCB1 overexpression in predicting outcome of CML patients: Where are we after a decade? XVIII. Slovensko-Český hematologický a transfuziologický zjazd. 20-22 October 2016, Bratislava, Slovak Republic, Interná medicína. 2016; S7, p. 25

11. RÁZGA, Filip – NÉMETHOVÁ, Veronika – MAZANCOVÁ, Petra – BULIAKOVÁ, B. – BÁBELOVÁ, A. – ŠELC, M. – GÁBELOVÁ, A. Magnetite nanoparticles in biomedicine: Critical role of particle characterization in interpretation of biological data. XXV. Biochemicky sjezd. 13-16 September 2016, Prague, Czech Republic, Book of Abstracts, p. 85

12. BULIAKOVÁ, B. – ŠELC, M – BÁBELOVÁ, A – NÉMETHOVÁ, Veronika – RÁZGA, Filip – GÁBELOVÁ, A. Genotoxicity of surface-modified magnetite nanoparticles raises concerns about their biosafety. XXV. Biochemicky sjezd. 13-16 September 2016, Prague, Czech Republic, Book of Abstracts, p. 225

13. MAZANCOVÁ, Petra – NÉMETHOVÁ, Veronika – RÁZGA, Filip – LACÍK, Igor. Controlled preparation and stabilization of chitosan/TPP sub-micron particles. XXIV International Conference on Bioencapsulation. 21-23 September 2016, Lisbon, Portugal, Book of Abstracts, p. 142-143

14. MAZANCOVÁ, Petra – RÁZGA, Filip – *VNUKOVÁ, Dominika* – NÉMETHOVÁ, Veronika – LACÍK, Igor. Lessons from TPP-mediated crosslinking of chitosan. Polymery. 8-10 June 2016, Stará Lesná, Slovak Republic, Book of Abstracts, p. 26-27

15. RÁZGA, Filip – NÉMETHOVÁ, Veronika – MAZANCOVÁ, Petra – BULIAKOVÁ, B. – BÁBELOVÁ, A. – ŠELC, M. – GÁBELOVÁ, A. Magnetite nanoparticles for biomedical applications: Role of particle characterization. Polymery. 8-10 June 2016, Stará Lesná, Slovak Republic, Book of Abstracts, p. 23

16. BULIAKOVÁ, B. – ŠELC, M. – BÁBELOVÁ, A. – NÉMETHOVÁ, Veronika – RÁZGA, Filip – ZAVISOVÁ, V. – URSÍNYOVÁ, M. – MANKA, J. – GÁBELOVÁ, A. Determination of nanoparticle uptake by flow cytometry and atomic absorption spectrometry. International Conference of Environmental and Occupational Health. 21-23 June 2016, Porto, Portugal, Book of Abstracts, p. 50

17. UHELSKÁ, Lucia – TREĽOVÁ, Dušana – RÁZGA, Filip – NÉMETHOVÁ, Veronika – MAZANCOVÁ, Petra – KRONEKOVÁ, Zuzana – *MIHALOVÁ, Andrea* – MARCHESE, E. – MCGARRIGLE, J. – OMAMI, M. – OBERHOLZER, J. – LACÍK, Igor. Novel PMCG microcapsules designed for pancreatic islets encapsulation towards pre-clinical validation using different animal models. Polymery. 8-10 June 2016, Stará Lesná, Slovak Republic, Book of Abstracts, p. 31-32

18. UHELSKÁ, Lucia – TREĽOVÁ, Dušana – RÁZGA, Filip – NÉMETHOVÁ, Veronika – MAZANCOVÁ, Petra – *MIHÁLOVÁ, Andrea* – KRONEKOVÁ, Zuzana – MARCHESE, E. – McGARRIGLE, J. – OMAMI, M. – OBERHOLZER, J. – LACÍK, Igor. SA-CS-PMCG microcapsules aimed for transplantation of encapsulated pancreatic islets into different animal models towards clinical

trials. Bratislava Young Polymer Scientist Workshop 2016, 14 March, Ždiar, Slovensko, prednáška CL-1-8, Abstract Book p.51

19. TREĽOVÁ, Dušana – UHELSKÁ, Lucia – RÁZGA, Filip – NÉMETHOVÁ, Veronika – MAZANCOVÁ, Petra – KRONEKOVÁ, Zuzana – *MIHÁLOVÁ, Andrea* – ROKSTAD, A. M. – MARCHESE, E. – McGARRIGLE, J. – OMAMI, M. – OBERHOLZER, J. – LACÍK, Igor. SA-CS-PMCG microcapsule concept: preparation, characterization, performance. 24th International Conference on Bioencapsulation 2016, 21 September, Lisbon, Portugal, poster P-05, Abstract Book p.104

Programy: Multilaterálne - iné

13.) Molekulovo-dynamické štúdium zmáčavosti silikátového povrchu pokrytého polymérmi. *(Molecular simulation study of the wetting behaviour of polymer grafted silica surface.)*

Zodpovedný riešiteľ:	Zuzana Benková
Trvanie projektu:	1.1.2014 / 31.1.2017
Evidenčné číslo projektu:	INT/PORTUGAL/P-05/2013
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Katedra chémie a biochémie Fakulta prírodných vied Univerzita v Porte
Počet spoluriešiteľských inštitúcií:	1 - India: 1
Čerpané financie:	mobilita

Dosiahnuté výsledky:

Dokončila sa publikácia venovaná termoresponzívnemu správaniu sa poly(N-izopropylakryl amidových) reťazcov zakotvených na povrchoch.

Výstupy:

1. BHANDARY, D. - BENKOVÁ, Zuzana - CORDEIRO, M. N. D. S. - SINGH, J. K. Molecular dynamics study of wetting behavior of grafted thermo-responsive PNIPAAm brushes. In Soft Matter, 2016, vol. 12, p. 3093-3102. (3.798 - IF2015). ISSN 1744-683X.

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

Zodpovedný riešiteľ:	Zuzana Kroneková
Trvanie projektu:	1.9.2016 / 31.3.2017
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:	mobilita

Dosiahnuté výsledky:

Projekt ABIOG nám umožnil nielen prehlbiť spoluprácu medzi zúčastnenými inštitúciami ale zároveň aj prediskutovať možnú budúcu spoluprácu v projektoch medzinárodného a/alebo celoeurópskeho charakteru.

Výstupy:

1. Brochure of ABIOG Partners : 2nd Meeting of ABIOG Project Managements Committee & Workshop. Bratislava, Slovak Republic : Polymer Institute of SAS, 2016. 30 P. ISBN 978-80-89841-02-8.

15.) 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:	1.9.2015 / 31.8.2018
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:	34 000.00 €

Dosiahnuté výsledky:

Skompletizovanie mechanizmu polymerizácie akrylamidu a kyseliny akrylovej. Prvé výsledky pre definovanie rýchlosti propagácie katiónových monomérov pomocou PLP-SEC metodiky.

Výstupy:

1. LACÍK, Igor - CHOVANCOVÁ, Anna - UHELSKÁ, Lucia - PREUSSER, C. - HUTCHINSON, R. A. - BUBACK, M. PLP-SEC studies into the propagation rate coefficient of acrylamide radical polymerization in aqueous solution. In Macromolecules, 2016, vol. 49, p. 3244-3253. (5.554 - IF2015). ISSN 0024-9297.

2. PREUSSER, C. - CHOVANCOVÁ, Anna - LACÍK, Igor - HUTCHINSON, R. A. Modeling the radical batch homopolymerization of acrylamide in aqueous solution. In Macromolecular Reaction Engineering, 2016, vol. 10, p. 490-501. (1.256 - IF2015). ISSN 1862-832X.

3. WITTENBERG, N. F. G. - PREUSSER, C. - KATTNER, H. - *STACH, Marek* - LACÍK, Igor - HUTCHINSON, R. A. - BUBACK, M. Modeling acrylic acid radical polymerization in aqueous solution. In Macromolecular Reaction Engineering, 2016, vol. 10, p. 95-107. (1.256 - IF2015). ISSN 1862-832X.

16.) The Chicago Diabetes Project: Globálna spolupráca pre funkčnú liečbu cukrovky. *(The Chicago Diabetes Project: Global collaboration for a functional cure.)*

Zodpovedný riešiteľ:	Igor Lacík
Trvanie projektu:	1.5.2007 /
Evidenčné číslo projektu:	
Organizácia je koordinátorom projektu:	nie
Koordinátor:	University of Illinois, Chicago
Počet spoluriešiteľských inštitúcií:	5 - Austrália: 1, Švajčiarsko: 1, Taliansko: 1, Nórsko: 1, USA: 1
Čerpané financie:	mobilita

Dosiahnuté výsledky:

V súčasnej fáze projektu je SA-SCS-PMCG mikrokapsula úplne tolerovaná v myšiach bez výskytu nežiadúceho fibrotického obrastenia resp. iných defektov, čo naznačuje, že po materiálovej stránke je naša mikrokapsula stabilná a vhodná pre daný zvierací model. Prázdne mikrokapsuly sú momentálne testované v makakoch v spolupráci s University of Illinois at Chicago (UIC).

Výstupy:

1. TAKÁČOVÁ, M. - HLOUŠKOVÁ, Gabriela - ZAŤOVIČOVÁ, M. - BENEJ, M. - SEDLÁKOVÁ, O. - KOPÁČEK, J. - PASTOREK, J. - LACÍK, Igor - PASTOREKOVÁ, S. Encapsulation of anti-carbonic anhydrase IX antibody in hydrogel microspheres for tumor targeting. In European Journal of Pharmaceutical Sciences, 2016, vol., no., p. 1-9 EPUB. (3.773 - IF2015). ISSN 0928-0987.

2. KRONEKOVÁ, Zuzana - PELACH, M. - MAZANCOVÁ, Petra - UHELSKÁ, Lucia - TREĽOVÁ, Dušana - ŠIFFALOVIČ, P. - MAJKOVÁ, E. - LACÍK, Igor. Confocal raman spectroscopy: A powerful tool for microcapsules characterization. In XXIV International Conference on Bioencapsulation : Lisbon,

Portugal, September 21-23, 2016. - Lisbon, Portugal : Bioencapsulation Research Group, 2016, p. 30-31.

3. TREĽOVÁ, Dušana - UHELSKÁ, Lucia - RÁZGA, Filip - NÉMETHOVÁ, Veronika - MAZANCOVÁ, Petra - KRONEKOVÁ, Zuzana - *MIHÁLOVÁ, Andrea* - ROKSTAD, A.M. - MARCHESE, E. - MCGARRIGLE, J. - OMAMI, M. - OBERHOLZER, J. - LACÍK, Igor. SA-CS-PMCG microcapsule concept: Preparation, characterization, performance. In XXIV International Conference on Bioencapsulation : Lisbon, Portugal, September 21-23, 2016. - Lisbon, Portugal : Bioencapsulation Research Group, 2016, p. 104-105.

17.) 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:	1.9.2016 / 31.8.2018
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: 4167 €

Dosiahnuté výsledky:

V prvej etape sme sa venovali príprave elektricky vodivej hybridnej elektródy, ktorá nahradí doposiaľ používanú platinu. Hybridom boli mnohostenné uhlíkové nanotrubičky pokryté vrstvou vodivého polyméru, polypyrolu. V prvej fáze sa optimalizovali vlastnosti hybridného materiálu variáciou jeho zloženia a použitím rôznych typov tenzidov.

18.) 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:	1.5.2012 / 31.5.2017
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: 3500 €

Dosiahnuté výsledky:

Dosiahla sa optimálna povrchová úpravou elektrostaticky zvlákneného PCL vodivým polymérom - polypyrolom. Snaha o komplexnú povrchovú úpravu bola úspešná, pričom na charakterizáciu a potvrdenie predpokladaných vlastností sa využilo široké spektrum metodík napr. SEM, DMA, XPS a FTIR. Tiež sa kvôli špecifickej príprave vlákien s prchavým monomérom - pyrolom použila metóda ToF-SIMS, na potvrdenie jeho prítomnosti. Cieľom prípravy takto upravených netkaných textílií je ich použitie pre tkanivové inžinierstvo. Keďže tento materiál bol v predbežných testoch potvrdený ako biokompatibilný, hľadá sa možnosť užšej spolupráce s biotechnologickými laboratóriami napr. v Zlíne pre komplexné testovanie vlastností ako je toxicita, rýchlosť rastu, delenia buniek a. i.

Výstupy:

1. OMASTOVÁ, Mária. Elastomeric nanocomposites for sensors and actuators application. In Modern Polymeric Materials for Environmental Applications : 6th International Seminar including COST MP1206 Workshop : Kraków, 27-29 April 2016. - Cracow, Poland: Department of Chemistry and Technology of

Polymers, Crocow University of Technology, 2016, 2016, vol. 6, s. 255-262. ISBN 978-83-937270-4-9.

2. ČÍKOVÁ, Eliška - ŠIŠKOVÁ, Alena - MIČUŠÍK, Matej - OMASTOVÁ, Mária. Electrospun conducting polymeric composite nanofibers. In Electrospin 2016 : 4th International Conference on Electrospinning 2016 : book of abstracts. - Salento, Italy : Universita del Salento, 2016, abstract no. 1273. Dostupné na internete: <http://electrospin20156.unisalento.it>.

Programy: Bilaterálne - iné

19.) Charakterizácia uväznených organických systémov pomocou externých prób. *(External probe characterization of the confined organics.)*

Zodpovedný riešiteľ:	Josef Bartoš
Trvanie projektu:	1.2.2014 / 31.12.2016
Evidenčné číslo projektu:	DAAD-SAV 2014-15
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Experimental Physik V, CEKM, Universität Augsburg, Nemecko
Počet spoluriešiteľských inštitúcií:	1 - Nemecko: 1
Čerpané financie:	mobilita

Dosiahnuté výsledky:

V rámci dokončenia DAAD 2016 grantu sa uzavrelo systematické štúdium jednej zo série zvolených modelových organických substancií tj. polárnom protickom 1-propanolu (1-PrOH) v objemovom (bulk) stave ako aj v priestorovo-limitovaných (uväznených, confined) stavoch silikagélu (SG) s rôznou veľkosťou pórov pomocou ESR, PALS a DSC techník. V prípade bulk 1-PrOH sa ESR spektrá spinovej sondy TEMPO analyzovali pomocou simulácií a získané rotačno-dynamické parametre sa porovnali s jeho makroskopickými termodynamickými a dynamickými z DSC a BDS ako aj mikroskopickými voľno-objemovými charakteristikami z PALS. Zistil sa rad koincidencií medzi rôznymi efektami na ESR a PALS odozvách, ktoré naznačujú na spoločný pôvod efektov a ktoré boli identifikované za použitia dynamických BDS a viskozitných dát v rámci dvoj-parametrového (TOP) modelu.

V prípade uväznených 1-PrOH/SG systémov sa našlo, že dynamika spinovej sondy TEMPO je menej spomalená, avšak viacej citlivá k zmene štrukturálno-dynamickému stavu média v dôsledku uväznenia oproti nepolárnemu n-HXD [Lukešová,M. et al. Eur.Phys.J. B 88,46–1-11(2015)]. V súčasnosti prebiehajú detailné spektrálne simulácie vybratého 1-PrOH/SG systému za účelom kvantifikácie zmeny v dynamických parametroch spinovej sondy TEMPO, ktoré sú zacielené na získania detailnejšieho náhľadu do potenciálne zmenenej štruktúry a dynamiky polárneho protického média v SG matriciach.

Výstupy:

1. BARTOŠ, Josef - ŠVAJDLENKOVÁ, Helena - ŠAUŠA, O. - LUKEŠOVÁ, Miroslava - EHLERS, D. - MICHL, M. - LUNKENHEIMER, P. - LOIDL, A. Molecular probe dynamics and free volume in organic glass-formers and their relationships to structural relaxation: 1-propanol. In Journal of Physics: Condensed Matter, 2016, vol. 28, no. 1, 015101. (2.209 - IF2015). ISSN 0953-8984.

2. LUKEŠOVÁ, Miroslava - ŠVAJDLENKOVÁ, Helena - SIPPEL, P. - REUTER, D. - MACOVÁ, Eva - BEREK, Dušan - ZALESKI, R. - EDELMANN, M. - LOIDL, A. - BARTOŠ, Josef. Spin probe dynamics of n-hexadecane and n-propanol in bulk and confined geometry. In BYPOS 2016 : 6th Bratislava Young Polymer Scientists Workshop : March 13th-18th, 2016 : High Tatras, Slovakia : workshop book. - Bratislava : Young Scientists Council of Polymer Institute of SAS, 2016, p. 101. ISBN 978-80-970923-8-2.

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

Zodpovedný riešiteľ:	Zuzana Benková
Trvanie projektu:	1.9.2016 / 31.7.2017
Evidenčné číslo projektu:	NORTE-01-0145-FEDER-000011
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Univerzita v Porte
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	mobilita

Dosiahnuté výsledky:

Boli uskutočnené testovacie molekulovo-dynamické výpočty systémov.

21.) Molekulovo-dynamické simulácie PEO-modifikovaných povrchov ponorených v matrici homopolymérnych tavenín alebo roztokov. *(Molecular dynamics simulations of PEO-modified surfaces immersed in a matrix of homopolymer melts or solutions.)*

Zodpovedný riešiteľ:	Zuzana Benková
Trvanie projektu:	1.4.2013 / 30.9.2016
Evidenčné číslo projektu:	SFRH/BPD/90265/2012
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Katedra chémie a biochémie Fakulta prírodných vied Univerzita v Porte
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	mobilita

Dosiahnuté výsledky:

Dokončili sa molekulovo-dynamické simulácie, ktorých výsledky budú analyzované a interpretované. Projekt bol ukončený.

Výstupy:

1. BHANDARY, D. - BENKOVÁ, Zuzana - CORDEIRO, M. N. D. S. - SINGH, J. K. Molecular dynamics study of wetting behavior of grafted thermo-responsive PNIPAAm brushes. In Soft Matter, 2016, vol. 12, p. 3093-3102. (3.798 - IF2015). ISSN 1744-683X.

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

Zodpovedný riešiteľ:	Martin Danko
Trvanie projektu:	1.1.2016 / 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:	mobilita

Dosiahnuté výsledky:

Projekt je zameraný na prípravu senzorov a optoelektronických zariadení na báze kompozitov z prírodných materiálov. Na začiatok sa pripravila séria nanovlákenných materiálov z fibroinu, získaného z prírodného hodvábu a perylen diimidových (PDI) derivátov. Aminokyselinová jednotka

na perylenových derivátoch prospešne vplýva na rozpustnosť týchto ťažko rozpustných látok. V prípade kyseliny aspartámovej sme získali vodorozpusté zlúčeniny čo nás posúva do takzvanej „green chemistry“. Luminiscenčné nanovlákenné vrstvy sa pripravili elektrostatickým zvlákňovaním roztokov fibroínu s perylenovými derivátmi. Spektrálne vlastnosti a reálne využitie bude predmetom štúdia v nasledujúcom roku.

Výstupy:

1. KOZMA, E. - MRÓZ, W. - VILLAFIORITA-MONTELEONE, F. - GALEOTTI, F. - ECKSTEIN ANDICSOVÁ, Anita - CATELLANI, M. - BOTTA, Ch*. Perylene diimide derivatives as red and deep red-emitters for fully solution processable OLEDs. In RSC Advances, 2016, vol. 6, iss. 66, p. 61175-61179. (3.289 - IF2015). ISSN 2046-2069.

2. ECKSTEIN ANDICSOVÁ, Anita - OPÁLEK, A. - KRONEKOVÁ, Zuzana - KLEINOVÁ, Angela - ŠIŠKOVÁ, Alena. Modification of silk fibrous mats for medical application. In N.I.C.E. 2016: Nature Inspires, Creativity Engineers : 3rd International Conference on Bioinspired and Biobased Chemistry & Materials : abstracts. - Nice, France : IUPAC, 2016, p. 274.

3. ECKSTEIN ANDICSOVÁ, Anita - OPÁLEK, A. - KRONEKOVÁ, Zuzana - KLEINOVÁ, Angela - ŠIŠKOVÁ, Alena. Preparation of modified silk fibrous mats for medical application. In BIMac 2016: XXII. Bratislava Conference on Macromolecules: Polymers with Tailored Architecture and Properties : programme book and book of abstracts. - Bratislava : Ústav polymérov SAV, 2016, p. 66. ISBN 978-80-89841-01-1.

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

Zodpovedný riešiteľ:	Jaroslav Mosnáček
Trvanie projektu:	1.1.2016 / 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:	mobilita

Dosiahnuté výsledky:

Spoločný bilaterálny projekt nadviazal na ESRF projekt POLYFRIEND. V rámci projektu sa študovala degradácia PLA/PHB a PLA/PHB/sadze zmesí za podmienok ich aplikácie ako mulčovacích fólií pre papriky ako i štúdium foto a hydrolytickej degradácie za laboratórnych podmienok. Taktiež sa pokračovalo v štúdiu vývoja superabsorbérnych hydrogélov na báze monomérov z obnoviteľných zdrojov.

24.) Antibakteriálne vlastnosti polymérov modifikovaných nízkoteplotnou plazmou. *(Antibacterial properties of polymers modified by low-temperature plasma.)*

Zodpovedný riešiteľ:	Igor Novák
Trvanie projektu:	1.1.2014 / 31.12.2016
Evidenčné číslo projektu:	-
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	1 - Česko: 1
Čerpané financie:	mobilita

Dosiahnuté výsledky:

Polymliečna kyselina (PLA) bola povrchovo modifikovaná rádiofrekvenčnou a mikrovlnovou plazmou vo vzduchu. Na plazmou modifikovaný povrch PLA sa následne kovalentne naviazala kyselina akrylová. Na povrch PLA očkovaný kyselinou akrylovou bol imobilizovaný ako

antibakteriálna látka D-glukozamín. Antibakteriálne upravený PLA bol študovaný z hľadiska povrchových a bakteriostatických vlastností, pričom sa testovala bakteriostatická účinnosť pre G+ a G- patogénne baktérie. Vyššia antibakteriálny efekt bol dosiahnutý pre bakteriálne kmň G+.

Výstupy:

1. SWILEM, A. E. - LEHOCKY, M. - HUMPOLICEK, P. - KUCEKOVA, Z. - JUNKAR, I. - MOZETIC, M. - HAMED, A. A. - NOVAK, Igor. Developing a biomaterial interface based on poly(lactid acid) via plasma-assisted covalent anchorage of D-glucosamine and its potential for tissue regeneration. In Colloids and Surfaces B - Biointerfaces, 2016, vol. 148, p. 59-65. (3.902 - IF2015). (2016 - Current Contents, WOS, SCOPUS). ISSN 0927-7765.

2. NOVÁK, Igor - LEHOCKÝ, M. - CHODÁK, Ivan - KARBASSI, E. - ASADINEZHAD, A. - PRACHÁR, Jozef. Antibacterial assessment of polyethylene treated by alginic acid using cold plasma. In Annals of Warsaw University of Life Sciences - SGGW : Forestry and Wood Technology, 2016, no. 95, p. 287-291. ISSN 1898-5912.

3. NOVÁK, Igor - *POPELKA, Anton* - PRACHÁR, Jozef - CHODÁK, Ivan - ŽIGO, Ondrej. Antibakteriálna modifikácia polyolefínov účinkom nízkoteplotnej plazmy = Antibacterial modification of polyolefins by the effect of low-temperature plasma. In Sborník IX. konference Pigmenty a pojiva. - Pardubice, ČR : Chemagazín, 2016, p. 22 - 25. ISBN 978-80-906269-1-1.

4. PRACHÁR, Jozef - NOVÁK, Igor - KLEINOVÁ, Angela - GEMEINER, P. - OMASTOVÁ, Mária - CHMELA, Štefan - BORSIG, Eberhard. Plasma grafting of polypropylene with organosilanes and its alkylamine treatment. In Vacuum, 2016, vol. 127, p. 38-44. (1.558 - IF2015). (2016 - Current Contents). ISSN 0042-207X.

25.) Štúdium povrchových a adhéznych vlastností polyimidu a jeho kopolymérov. *(Study of surface and adhesive properties of polyimide and its copolymers.)*

Zodpovedný riešiteľ:	Igor Novák
Trvanie projektu:	1.1.2012 / 31.12.2016
Evidenčné číslo projektu:	-
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	1 - Česko: 1
Čerpané financie:	mobilita

Dosiahnuté výsledky:

Boli skúmané povrchové a adhézne vlastnosti lineárnych a vysoko vetvených polyimidov modifikovaných mezopórovitým SiO2 ako aj po modifikácii nízkoteplotnou bariérovou alebo rádiofrekvenčnou plazmou. Prostredníctvom FTIR, XPS a ToF SIMS bolo stanovené chemické zloženie skúmaných polyimidov. Vysoko vetvené polyimidy v porovnaní s vysokovetvenými polyimidmi dosahovali nizšie hodnoty voľnej povrchovej energie a jej polárnej zložky. S rastom obsahu mezopórovitého SiO2 vo vysokovetvených polyimidoch súčasne rástla ich hydrofóbnosť a polárna zložka voľnej povrchovej energie klesala a kontaktný uhol vody narastal.

Výstupy:

1. NOVÁK, Igor - *POPELKA, Anton* - ŠPITÁLSKY, Zdenko - *KRUPA, Igor* - TAVMAN, S. Polyolefin in packaging and food industry. In Polyolefin Compounds and Materials : Fundamentals and Industrial Applications. - Switzerland : Springer International Publishing, 2016, chapter. 7, p. 181-199. ISBN 978-3-319-25980-2.

2. *POPELKA, Anton* - NOVÁK, Igor - *KRUPA, Igor*. Polyolefin adhesion modification. In Polyolefin Compounds and Materials : Fundamentals and Industrial Applications. - Switzerland : Springer International Publishing, 2016, chapter. 8, p. 201-228. ISBN 978-3-319-25980-2.

26.) 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 - TÜB?TAK JRP 2014 /2
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	1 - Turecko: 1
Čerpané financie:	39 960.00 € MVTS

Dosiahnuté výsledky:

V rámci bilaterálnej spolupráce a projektu MVTS s Tureckými partnermi sme pripravili hybridné kompozity na báze mnohostenných uhlíkových nanotrubičiek (MWCNT) s poly (3-hexyltiofénom) (P3HT) a polypyrolom (PPy) za použitia rotačného RF plazmového reaktora. FTIR, SEM a XPS výsledky potvrdili pokrytie MWCNT vodivými polymérmi na povrchu. Pripravené hybridné kompozitné materiály boli použité ako protielektródy (nahradzujú platinovú elektródu) vo farbivom senzibilizovaných solárnych článkoch (DSSC) a merala sa účinnosť konverzie takýchto článkov. DSSC s P3HT/MWCNT kompozitmi vykázali lepšie výsledky v porovnaní s tými, kde bol požitý PPy/MWCNT kompozit. V budúcom období sa budú podrobnejšie študovať hybridné materiály na báze MWCNT kde sa použije na modifikáciu ich povrchu chemická oxidačná alebo elektrochemická polymerizácia monomérov.

Výstupy:

1. KULIČEK, Jaroslav - MIČUŠÍK, Matej - GEMEINER, P. - MIKULA, M. - OKSUZ, A. U. - OMASTOVÁ, Mária. Polypyrrole/carbon nanotubes composites as counter electrodes in solar cells. In 1st Conference of Organic & Perovskite Solar Cells and 6th MC/WG meeting of Cost Action MP1307 : programme and book of abstracts. - Heraklion, Crete : Nano Group of TEI of Crete, 2016, p.42. Dostupné na internete: <solar.teicrete.gr>.

2. COGAL, S. - ERTEN ELA, S. - CELIK COGAL, G. - OMASTOVÁ, Mária - MIČUŠÍK, Matej - KURALAY, F. - UYGUN OKSUZ, A. Plasma-enhanced preparation of conducting polymers/multi-walled carbon nanotube nanocomposites for dye-sensitized solar cells. In New Trends in Solar Cells : book of abstracts. - Bratislava : Polymer Institute of SAS, 2016, p. 106-107. ISBN 978-80-970923-9-9.

3. KULIČEK, Jaroslav - GEMEINER, P. - MIČUŠÍK, Matej - ČÍKOVÁ, Eliška - ŠVORC, Ľ. - UYGUN OKSUZ, A. - OMASTOVÁ, Mária. Multiwall carbon nanotubes/polypyrrole composites as counter electrodes in dye sensitized solar cells. In New Trends in Solar Cells : book of abstracts. - Bratislava : Polymer Institute of SAS, 2016, p. 111-112. ISBN 978-80-970923-9-9.

27.) TRAnsparentné elektricky vodivé polymérne nanKOmpozity na báze nanoštruktúrneho GRafitu. *(Transparent, electrically conductive polymeric nanocomposites on the base of nanostructured graphite.)*

Zodpovedný riešiteľ:	Zdenko Špitálsky
Trvanie projektu:	1.1.2015 / 31.12.2016
Evidenčné číslo projektu:	SK-SRB-2013-0044
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	2 350.00 (APVV)

Dosiahnuté výsledky:
Ako polymérna matrica sa najlepšie osvedčil polyamid, ktorý je transparentný, má dobré elastické vlastnosti a vysokú adhéziu k rôznym povrchom. V prípade polymérnych kompozitov sa potvrdili ich antibakteriálne účinky, ktoré boli pozorované u čistého nanoplniva. Navyše u elektrostaticky zvláknených filmov sa pozoroval vysoký kontakný uhol zmáčania, čo výrazne potláča zachytávanie bakteriáneho biofilmu. Týmito metódami je možné pripraviť vodivé filmy od hrúbky niekoľkých nanometrov (elektrostatické zvlákňovanie) až po mikrometrové hrúbky (obe metodiky). Porovnaním oboch metód sa zistilo, že elektrostatické zvlákňovanie vedie k vodivejším vrstvám pri nižsom obsahu grafénového plniva s vyššou transparenciou, ale odlievaním sa získali vodivé kompozity s lepšími mechanickými vlastnosťami. S rastom hrúbky polymérneho kompozitu klesala jeho transparencia.

Výstupy:

1. JOVANOVIĆ, S. - MARKOVIĆ, Zoran M. - BUDIMIR, M. - ŠPITÁLSKY, Zdenko - VIDOESKI, B. - MARKOVIĆ, B. T. Effects of low gamma irradiation dose on the photoluminescence properties of graphene quantum dots. In *Optical and Quantum Electronics*, 2016, vol. 48, art.no. 259. (1.290 - IF2015). ISSN 0306-8919.

2. MARKOVIĆ, Zoran M. - BUDIMIR, M. D. - KEPIĆ, D. P. - HOLCLAJTNER-ANTUNOVIĆ, I. D. - MARINOVIĆ-CINCOVIĆ, M. T. - DRAMIĆANIN, M. D. - SPASOJEVIĆ, V. D. - PERUŠKO, D. B. - ŠPITÁLSKY, Zdenko - MIČUŠÍK, Matej - PAVLOVIĆ, V. B. - TODOROVIĆ-MARKOVIĆ, B. M. Semi-transparent, conductive thin films of electrochemical exfoliated graphene. In *RSC Advances*, 2016, vol. 6, p. 39275-39283. (3.289 - IF2015). ISSN 2046-2069.

3. MARKOVIĆ, Zoran M. - MATIJAŠEVIĆ, D. - PAVLOVIĆ, V. - HOLCLAJTNER-ANTUNOVIĆ, I.- ŠPITALSKÝ, Zdenko - MIČUŠIK, Matej - DRAMIĆANIN, M. - MILIVOJEVIĆ, D. - NIKŠIĆ, M. - TODOROVIĆ MARKOVIĆ, B. Antibacterial potential of electrochemically exfoliated graphene sheets. *Applied Materials&Interfaces* – zaslaný

4. ŠPITÁLSKY, Zdenko - MIČUŠÍK, Matej - BUGÁROVÁ, Nikola - JOCHEC MOŠKOVÁ, Daniela - CSOMOROVÁ, Katarína - MARKOVIĆ, Zoran M. - BODIK, M. Reduction of graphene oxide to graphite. In *New Trends in Solar Cells : book of abstracts*. - Bratislava : Polymer Institute of SAS, 2016, p. 118-119. ISBN 978-80-970923-9-9.

5. MARKOVIĆ, Zoran M. - ŠPITÁLSKY, Zdenko - MIČUŠÍK, Matej - BUDIMIR, M. D. - KEPIĆ, D. P. - HOLZLAJTNER-ANTUNOVIĆ, I. D. - MARINOVIĆ-CINCOVIĆ, M. T. - SPASOJEVIĆ, V. D. - PERUŠKO, D. B. - TODOROVIĆ-MARKOVIĆ, B. M. Comparative study of electrochemically exfoliated graphene electrodes. In *New Trends in Solar Cells : book of abstracts*. - Bratislava : Polymer Institute of SAS, 2016, p. 78-79. ISBN 978-80-970923-9-9.

6. MARKOVIĆ, Zoran M. - ŠPITÁLSKY, Zdenko - MIČUŠÍK, Matej - DAKIC, I. - MILENKOVIC, M. - TODOROVIC-MARKOVIĆ, B. M. - BUDIMIR, M. M. - TRAJKOVIC, V. S. In vitro comparison of antibacterial activity of graphene, graphene oxide and carbon nanotube. In *Graphene Week 2016 : abstract book*. - Warsaw, Poland : Graphene Flagship, 2016, abstract no. 3348041. Názov z obrazovky. Požaduje sa Adobe Acrobat. Dostupné na internete: <www.graphene-glagship.eu>.

Programy: ERANET

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

Zodpovedný riešiteľ:	Igor Lacík
Trvanie projektu:	1.11.2014 / 31.8.2017
Evidenčné číslo projektu:	
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Scuola Superiore Sant'Anna

Počet spoluriešiteľských inštitúcií: 1 - Taliansko: 1
Čerpané financie: 24 996 €
Dosiahnuté výsledky:
V hodnotiacom období sa v rámci riešenia projektu podarilo pripraviť nový typ hydrogélových vrstiev kovalentne viazaných na polyimidovú podložku, ktoré sa vyznačovali vysokou biokompatibilitou v in vitro podmienkach a taktiež Youngovým modulom pružnosti na úrovni neurálneho tkaniva. Na prípravu hydrogélových vrstiev boli použité kopolyméry obsahujúce biokompatibilnú poly(zwitteriónovú) zložku a fotocitlivú azidofenylovú jednotku schopnú poskytovať fotoindukované sieťovanie a očkovanie na rôzne polymérne povrchy. V závislosti od obsahu fotocitlivej zložky a koncentrácie vodného roztoku kopolyméru pri nanášaní sa pripravili stabilné hydrogélové vstvy s rôznou hrúbkou (5-10 ?m) a tuhosťou v rozpätí 2-19 kPa. Taktiež sa pripravili hydrogély na báze poly(2-alkyl-2-oxazolínov) tiol-énovou reakciou a s rôznymi ditiolovými sieťovadlami. V tomto prípade sa získali hydrogély s Youngovým modulom pružnosti od 6 do 128 kPa.

Výstupy:

1. KRONEK, Juraj - KRONEKOVÁ, Zuzana - PETRENČÍKOVÁ, Nadežda - KLEINOVÁ, Angela - PAULOVIČOVÁ, E. - PAULOVIČOVÁ, L. Poly(2-isopropenyl-2-oxazoline) as a functional polymer for biomedical application. In BIMac 2016 : XXII. Bratislava Conference on Macromolecules : Polymers with Tailored Architecture and Properties : programme book and book of abstracts. - Bratislava : Ústav polymérov SAV, 2016, p. 27

2. ŠRÁMKOVÁ, Petra - ZAHORANOVÁ, Anna - KRONEKOVÁ, Zuzana - KRONEK, Juraj. Poly(2-oxazoline) hydrogels by photoinduced thiol-ene click reaction using different dithiol crosslinkers. In BIMac 2016 : XXII. Bratislava Conference on Macromolecules : Polymers with Tailored Architecture and Properties : programme book and book of abstracts. - Bratislava : Ústav polymérov SAV, 2016, p. 57.

3. ŠRÁMKOVÁ, Petra - ŠIŠKOVÁ, Alena - KRONEK, Juraj. Thiol-ene click reaction as efficient method for preparation of cross-linked materials based on poly(2-oxazolines). In BYPOS 2016 : 6th Bratislava Young Polymer Scientists Workshop : March 13th-18th, 2016 : High Tatras, Slovakia : workshop book. - Bratislava : Young Scientists Council of Polymer Institute of SAS, 2016, p. 103.

4. ŠRÁMKOVÁ, Petra – ZAHORANOVÁ, Anna – KRONEKOVÁ, Zuzana – ŠIŠKOVÁ, Alena – KRONEK, Juraj. Poly(2-oxazoline) hydrogels by photoinduced thiol-ene "Click" reaction using different dithiol crosslinkers. Odoslané do Journal of Polymer Research, JPOL-S-16-01140.

Programy: Iné

29.) 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 / 30.10.2017
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: 0
Čerpané financie: JDRF: 70597 €
Dosiahnuté výsledky:
V súčasnej fáze projektu je SA-SCS-PMCG mikrokapsula úplne tolerovaná v myšiach bez výskytu nežiadúceho fibrotického obrastenia resp. iných defektov, čo naznačuje, že po materiálovej stránke

je naša mikrokapsula stabilná a vhodná pre daný zvierací model. Prázdne mikrokapsuly sú momentálne testované v makakoch v spolupráci s University of Illinois at Chicago (UIC). V kompletnej ľudskej krvi mikrokapsuly neaktivujú komplement as produkciu cytokínov. Významným výstupom je zavedenie metodiky konfokálnej Ramanovej mikroskopie pre charakterizáciu mikrokapsúl pred transplantáciou a po explantácii.

Výstupy:

1. TAKÁČOVÁ, M. - HLOUŠKOVÁ, Gabriela - ZAŤOVIČOVÁ, M. - BENEJ, M. - SEDLÁKOVÁ, O. - KOPÁČEK, J. - PASTOREK, J. - LACÍK, Igor - PASTOREKOVÁ, S. Encapsulation of anti-carbonic anhydrase IX antibody in hydrogel microspheres for tumor targeting. In European Journal of Pharmaceutical Sciences, 2016, vol., no., p. 1-9 EPUB. (3.773 - IF2015). ISSN 0928-0987.

2. KRONEKOVÁ, Zuzana - PELACH, M. - MAZANCOVÁ, Petra - UHELSKÁ, Lucia - TREĽOVÁ, Dušana - ŠIFFALOVIČ, P. - MAJKOVÁ, E. - LACÍK, Igor. Confocal raman spectroscopy: A powerful tool for microcapsules characterization. In XXIV International Conference on Bioencapsulation : Lisbon, Portugal, September 21-23, 2016. - Lisbon, Portugal : Bioencapsulation Research Group, 2016, p. 30-31.

3. TREĽOVÁ, Dušana - UHELSKÁ, Lucia - RÁZGA, Filip - NÉMETHOVÁ, Veronika - MAZANCOVÁ, Petra - KRONEKOVÁ, Zuzana - *MIHÁLOVÁ, Andrea* - ROKSTAD, A.M. - MARCHESE, E. - MCGARRIGLE, J. - OMAMI, M. - OBERHOLZER, J. - LACÍK, Igor. SA-CS-PMCG microcapsule concept: Preparation, characterization, performance. In XXIV International Conference on Bioencapsulation : Lisbon, Portugal, September 21-23, 2016. - Lisbon, Portugal : Bioencapsulation Research Group, 2016, p. 104-105.

4. LACÍK, Igor. – ROKSTAD, AM. – OBERHOLZER, J. Multicomponent microcapsules for allogeneic islet transplantation in a comprehensive, preclinical non-human primate model. 9.-11.04.2016, JEC JDRF meeting, New York, USA (pozvaná prednáška)

5. LACÍK, Igor. The need for creation the JEC JDRF microcapsule characterization unit. The gaps discussion. 9.-11.04.2016, JEC JDRF meeting, New York, USA (pozvaná prednáška)

6. LACÍK, Igor. – ROKSTAD, AM. – OBERHOLZER, J. Multicomponent microcapsules for allogeneic islet transplantation in a comprehensive, preclinical non-human primate model. 20.-22.09.2016, JEC JDRF meeting, Boston, USA (pozvaná prednáška)

30.) 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:	1.1.2015 / 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:	25 000.00 € MVTS

Dosiahnuté výsledky:

V rámci spoločného výskumného projektu s dvomi univerzitami v Taiwane sa riešili dve rôzne témy. 1) pokračovalo sa vo vývoji radikálovej polyadície s prenosom atómu za účelom prípravy polymérov s hydrolyzovateľným hlavným reťazcom. Ako monomér sa použil 4-vinylbenzyl 2-bromo-2-fenylacetát, ktorý okrem vinylovej väzby obsahuje v svojej štruktúre i iniciačnú alkyl bromidovú skupinu a teda slúži ako monomér i ako iniciátor. 2) pripravili sa bifunkčné homopolyméry PBA a PMMA, ktoré by sa mali následne využiť pre prípravu multiblokových kopolymérov s amfifilnými vlastnosťami.

Výstupy:

1. MRLÍK, M. - ILČÍKOVÁ, Markéta - MOSNÁČEK, Jaroslav - PAVLÍNEK, V. Modification of carbon nanotubes: Improvement of physical and photo-actuating properties of their elastomeric composites. In Research and innovation in carbon nanotube-based composites. - Hong Kong: The World Academic Publishing, 2015, chapter 7, P. 103-124. ISBN 978-0-9889190-1-3.

2. ILČÍKOVÁ, Markéta - DANKO, Martin - DOROSHENKO, M. - BEST, A. - MRLÍK, M. - CSOMOROVÁ, Katarína - ŠLOUF, M. - CHORVÁT Jr., D. – KOYNOV, K. – MOSNÁČEK, Jaroslav. Visualization of carbon nanotubes dispersion in composite by using confocal laser scanning microscopy, In European Polymer Journal, 79 (2016) 187–197.

3. HUANG, C.-F. - KUO S.-W. - MORAVČÍKOVÁ, Daniela - LIAO, J.-C. - HAN, Y.-M. - LEE, T.-H. - WANG, P.-H. - LEE, R.-H. - TSIANG, R. C.-C. - MOSNÁČEK, Jaroslav. Effect of variations of CuIIX2/L, surface area of Cu0, solvent, and temperature on atom transfer radical polyaddition of 4-vinylbenzyl 2-bromo-2-isobutyrate inimers. In RSC Advances, Vol. 6, (2016) 51816-51822.

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:	1.1.2015 / 31.12.2018
Evidenčné číslo projektu:	2/0113/15
Organizácia je koordinátorom projektu:	nie
Koordinátor:	
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	

Dosiahnuté výsledky:

i) Dizajn a príprava liekového nosiča na báze chitozánu (pracuje sa na jeho stabilizácii pre využitie vo fyziologických podmienkach)

ii) Syntéza a charakterizácia značených chemických zlúčenín určených na povrchovú úpravu nanočastíc na báze magnetitu

iii) Charakterizácia veľkosti a koloidnej stability nanočastíc na báze zlata a magnetitu

iv) In vitro testovanie nanočastíc na báze magnetitu a zlata s cieľom preskúmať ich akútnu cytotoxicitu

Výstupy:

1. RÁZGA, Filip - *VNUKOVÁ, Dominika* - NÉMETHOVÁ, Veronika - MAZANCOVÁ, Petra - LACÍK, Igor. Preparation of chitosan-TPP-sub-micron particles: Critical evaluation and derived recommendations. In Carbohydrate Polymers, 2016, vol. 151, p. 488-499

2. NÉMETHOVÁ, Veronika – BULIAKOVÁ, B. – MAZANCOVÁ, Petra – BÁBELOVÁ, A – ŠELC, M – MORAVČÍKOVÁ, Daniala – KLEŠČÍKOVÁ, Lucia – URSÍNYOVÁ, M – GÁBELOVÁ, A – RÁZGA, Filip. Intracellular uptake of magnetite nanoparticles: a focus on physico-chemical characterization and interpretation of in vitro data. Mater Sci Eng C Mater Biol Appl. 2017; vol. 70, p. 161-168

3. MAZANCOVÁ, Petra – NÉMETHOVÁ, Veronika – LACÍK, Igor – RÁZGA, Filip. Chitosan-based particles: The (forgotten) interplay between process, properties and performance. Mater Sci Eng C Mater Biol Appl. 2016; vol. 71, p. 570-571

4. 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. Nanomedicine. 2016; vol. 13, p. 69-82

5. RÁZGA, Filip – NÉMETHOVÁ, Veronika – MAZANCOVÁ, Petra – BULIAKOVÁ, B. – BÁBELOVÁ, A. – ŠELC, M. – GÁBELOVÁ, A. Magnetite nanoparticles in biomedicine: Critical role of particle characterization in interpretation of biological data. XXV. Biochemicky sjezd. 13-16 September 2016, Prague, Czech Republic, Book of Abstracts, p. 85

6. BULIAKOVÁ, B. – ŠELC, M – BÁBELOVÁ, A – NÉMETHOVÁ, Veronika – RÁZGA, Filip – GÁBELOVv, A. Genotoxicity of surface-modified magnetite nanoparticles raises concerns about their biosafety. XXV. Biochemicky sjezd. 13-16 September 2016, Prague, Czech Republic, Book of Abstracts, p. 225

7. MAZANCOVÁ, Petra – NÉMETHOVÁ, Veronika – RÁZGA, Filip – LACÍK, Igor. Controlled preparation and stabilization of chitosan/TPP sub-micron particles. XXIV International Conference on Bioencapsulation. 21-23 September 2016, Lisbon, Portugal, Book of Abstracts, p. 142-143

8. MAZANCOVÁ, Petra – RÁZGA, Filip – VNUKOVÁ, Dominika – NÉMETHOVÁ, Veronika – LACÍK, Igor. Lessons from TPP-mediated crosslinking of chitosan. Polymery. 8-10 June 2016, Stará Lesná, Slovak Republic, Book of Abstracts, p. 26-27

9. RÁZGA, Filip – NÉMETHOVÁ, Veronika – MAZANCOVÁ, Petra – BULIAKOVÁ, B. – BÁBELOVÁ, A. – ŠELC, M. – GÁBELOVÁ, A. Magnetite nanoparticles for biomedical applications: Role of particle characterization. Polymery. 8-10 June 2016, Stará Lesná, Slovak Republic, Book of Abstracts, p. 23

10. BULIAKOVÁ, B. – ŠELC, M. – BÁBELOVÁ, A. – NÉMETHOVÁ, Veronika – RÁZGA, Filip – ZÁVIŠOVÁ, V. – URSÍNYOVÁ, M. – MANKA, J. – GÁBELOVÁ, A. Determination of nanoparticle uptake by flow cytometry and atomic absorption spectrometry. International Conference of Environmental and Occupational Health. 21-23 June 2016, Porto, Portugal, Book of Abstracts, p. 50

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:	1.1.2016 / 31.12.2019
Evidenčné číslo projektu:	2/0030/16
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	7 200.00+380.00 €

Dosiahnuté výsledky:

Kombinované štúdium rotačnej dynamiky spinovej sondy *TEMPO* a anihilácie *orto-pozitrónia* (*o-Ps*) v oligomérnom *poly(izoprén)e (1,4-PIP 0.8k)* pomocou ESR v termínoch spektrálneho parametra mobility, $2A_{zz}$', resp. PALS [Bartoš,J.et al., Chem.Phys.Lett. 602 28 (2014)] bolo dokompletované i) získanim korelačných časov z detailných spektrálnych simulácií ESR spektier a ii) domeraním a interpretáciou vzájomných relácií ESR vs. PALS odoziev pomocou detailného vyšetrenia relaxačnej dynamiky média pomocou BDS. Spektrálna evolúcia spinovej sondy *TEMPO* zo simulácií v širokom teplotnom intervale 100 K – 300 K vykazuje tri odlišné oblasti mobility i) pomalý režim v nízkoteplotnej oblasti, ii) dynamická heterogenita tj. koexistencia pomalého a rýchleho režimu v prechodnej teplotnej oblasti a iii) rýchly režim vo vysokoteplotnej oblasti s charakteristickými ESR teplotami $T_{X1}^{slow} = T_{Xin}^{fast} = 155$ K, $T_{X2}^{slow} = 186$ K, $T_c \sim 236$ K and $T_{X1}^{fast} = 260$ K. Tieto sú v úzkej koincidencii s charakteristickými PALS teplotami pre *1,4-PIP 0.8k*: $T_{b1}^{G} = 160$ K, $T_g^{PALS} = 190$ K, $T_{b1}^{L} = 227$ K a $T_{b2}^{L} = 263$ K. Konečne, pomocou BDS bolo odhalené, že rôzne aspekty relaxačnej dynamiky *1,4-PIP 0.8k* sú zodpovedné za pozorované efekty v jeho ESR

a PALS odozvách v kvapalnom stave, tj. nástup *segmentálneho* módu relaxácie pri $T_c \cong T_{b1}^{L}$ a maximum *segmentálneho* módu a nástup tzv. *normalového* módu relaxácie pre $T_{X1}^{fast} \cong T_{b2}^{L}$.
2. Rotačná dynamika spinovej sondy *TEMPO* v *glycerole* z ESR bola porovnaná s anihiláciou *orto-pozitrónia (o-Ps)* z PALS [Bartoš,J. et al.: J.Non-Cryst. Solids 351, 2599 (2005)] a obidva fenomény sú interpretované pomocou publikovaných BDS ako aj NS dát. Rotačné korelačné časy v pomalom režime vykazujú dve Arrheniovské oblasti s charakteristickou ESR teplotou T_{X1}^{τ} v blízkosti charakteristickej PALS teploty T_{b1}^{L}, ktoré sú spojené so sekundárnym β procesom nad T_g. Nadväzne, prechod z pomalého do rýchleho pohybového režimu pri charakteristickej ESR teplote T_c^{τ} blízkej k charakteristickej PALS teplote T_{b2}^{L} nasledovaný neArrheniovským chovaním v rýchlom režime je plne spriahnutý s primárnym α procesom.
3. 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 vykonalo kombinované ESR a DSC vyšetrovanie *CHX* uväzneného v sérii *silikagélových (SG)* matríc s rôznou veľkosťou pórov od 60 Å do 300 Å. Zistilo sa dramatické spomalenie rotačnej dynamiky spinovej sondy *TEMPO*, a relatívne slabá závislosť od veľkosti póru matrice, ktoré je predpokladaným dôsledkom preferenčnej interakcie polárnej spinovej sondy *TEMPO* so silanolovými skupinami povrchu *SG* matríc.Táto hypotéza sa bude verifikovať pomocou ESR merani *CHX* v špeciálne modifikovanej *SG* matrici.

Výstupy:

1. ŠVAJDLENKOVÁ, Helena - ARRESE-IGOR, S. - NÓGELLOVÁ, Zuzana - ALEGRÍA, A. - BARTOŠ, Josef. Molecular reorientation and its dynamic heterogeneity in relation to free volume and relaxation dynamics in organic glass formers: oligomer cis-1,4-poly(isoprene. Journal of Polymer Science – B. Polymer Physics - polb.20160691, odoslané

2. ŠVAJDLENKOVÁ, Helena - S-ARRESE, Igor - NÓGELLOVÁ, Zuzana - ALEGRÍA, A. - BARTOŠ, Josef. Dynamic heterogeneity in relation to free volume and relaxation dynamics in oligomer cis-1,4-poly(isoprene). In Polyméry 2016: IX. Slovensko - Česká konferencia: program a zborník príspevkov. - Bratislava: Ústav polymérov SAV, 2016, s. 92-93. ISBN 978-80-89841-00-4.

3. BARTOŠ, Josef - ŠVAJDLENKOVÁ, Helena. On the mutual relationships between spin probe mobility, free volume and relaxation dynamics in glass former. Glycerol. Chem.Phys.Lett. - CPLETT-16-1653. odoslané

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:	1.1.2016 / 31.12.2019
Evidenčné číslo projektu:	2/0098/16
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	2 679.00 €

Dosiahnuté výsledky:
Boli uskutočnené testovacie molekulovo-dynamické výpočty systémov.

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:	1.1.2014 / 31.12.2017

Evidenčné číslo projektu: 2/0040/14
Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: 2 412.00 €

Dosiahnuté výsledky:

Zvláštna pozornosť je venovaná nanočasticiam so štruktúrou jadro-obal na báze vzácnych kovov a biomolekúl ako napr. DNA, proteiny... Vyznačujú sa zlepšenými koloidnými vlastnosťami a netradične vysokou funkčnosťou, spôsobenou blízkosťou funkčne rozdielnych zložiek. Organická vrstva tvorená vodorozpustným (bio)polymérom zabezpečuje miesto pre modifikáciu a funkcionalizáciu povrchu a ich využitie v nanomedicine. S použitím vodorozpustného monoméru v disperznej polymerizácii sa dosiahne požadovaná povrchová funkcionalizácia a aj príprava nanočatíc v jednostupňovej reakcii pozostávajúcej z redukcie kovovej soli a stabilizácii kovových nanočastíc tvoreným polymérom (napr. kyseliny akrylovej a akrylamidu).

Výstupy:

1. CAPEK, Ignác. Noble metal nanoparticles and their (bio) conjugates. I. Preparation. In International Journal of Chemistry, 2016, vol. 8, no. 1, p. 74-85. ISSN 1916-9701.

2. CAPEK, Ignác. Noble metal nanoparticles and their (bio) conjugates. II. Preparation. In International Journal of Chemistry, 2016, vol. 8, no.1, p. 86-101. ISSN 1916-9701.

3. CAPEK, Ignác. Photopolymerization of acrylamide in the very low monomer concentration range. In Designed Monomers and Polymers, 2016, vol. 19, no. 4, p. 290-296. (1.497 - IF2015). ISSN 1385-772X.

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

Zodpovedný riešiteľ: Peter Cifra
Trvanie projektu: 1.1.2016 / 31.12.2019
Evidenčné číslo projektu: 2/0055/16
Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: 2 679.00 €

Dosiahnuté výsledky:

V súvislosti s jednomolekulovými experimentami pri charakterizácii lineárnych a cyklických makromolekúl v nanofluidných zariadeniach boli vyšetrené podmienky linearizácie týchto makromolekúl pri rôznych podmienkach geometrie kanálov a topológie reťazcov.

Výstupy:

1. BENKOVÁ, Zuzana - NÁMER, Pavol - CIFRA, Peter. Comparison of a stripe and slab confinement for ring and linear macromolecules in nanochannel. In Soft Matter, 2016, vol. 12, p. 8425-8439. (3.798 - IF2015). ISSN 1744-683X.

2. BENKOVÁ, Zuzana - NÁMER, Pavol - CIFRA, Peter. Comparison of stripe to slab confinement for ring and linear macromolecules in nanochannel. In Polyméry 2016 : IX. Slovensko - Česká konferencia : program a zborník príspevkov. - Bratislava : Ústav polymérov SAV, 2016, s. 65-66. ISBN 978-80-89841-00-4. výveska

3. CIFRA, Peter - BENKOVÁ, Zuzana - NÁMER, Pavol. From stripe to slab confinement for DNA linearization in nanochannels. In APS March Meeting 2016 : abstract book. - Baltimore, USA : American Physical Society, 2016, h41.8. Názov z obrazovky. Požaduje sa Acrobat Reader. Dostupné na internete: <http://meetings.aps.org/link/BAPS.2016.MAR.H41.8>. Prednáška

6.) Fotochemicky aktívne systémy a značky pre polymérny výskum. *(Photochemically active systems and probes for polymer research.)*

Zodpovedný riešiteľ:	Martin Danko
Trvanie projektu:	1.1.2013 / 31.12.2016
Evidenčné číslo projektu:	2/0112/13
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	11 863.00 €

Dosiahnuté výsledky:

Pokračovalo sa v charakterizácií katiónových derivátov s benzo(tris)tiazolínovým akceptorom a aminoarylovým donorom. Deriváty vykazujú veľmi zaujímavé zvýšenie kvantového výťažku fluorescencie v niektorých prípadoch až o 2 rády v polymérnych matriciach neutrálneho PVC a aniónového poly(styrén-sulfonátu) sodného oproti hodnotám v roztokoch, a to v dôsledku zabrzdenia rotácie dimetylamínového donora. Táto vlastnosť fluorescenčného rotora bola využitá na vizualizáciu bunkových štruktúr ako aj na monitorovanie polymerizačných reakcií. V prípade radikálových polymerizácií však dochádza k výraznému zhášaniu fluorescencie pravdepodobne v dôsledku ataku radikálov s násobnými väzbami linkera chromofóru. Pokračovalo sa v spektrálnej charakterizácií aduktov pyrénu a tetrametyl piperidínu. Najmä imínový mostík spôsobuje fotoelektrónový prechod (PET) a zhášanie fluorescencie pyrénu, prejavuje sa to však aj na alkylamínovom mostíku. Polárne protické rozpúšťadlá spôsobujú špecifické interakcie najmä derivátov piperidín-amínu čo vedie k tvorbe excimérov a vzrastu emisie. Stráca sa PET a prejavuje sa viac zhášanie piperidínových-N-oxylov.

Výstupy:

1. ILČÍKOVÁ, Markéta - DANKO, Martin - DOROSHENKO, M. - BEST, A. - MRLÍK, M. - CSOMOROVÁ, Katarína - ŠLOUF, M. - CHORVÁT, D. Jr. - KOYNOV, K. - MOSNÁČEK, Jaroslav. Visualization of carbon nanotubes dispersion in composite by using confocal laser scanning microscopy. In European Polymer Journal, 2016, vol. 79, p. 187-197. (3.485 - IF2015). ISSN 0014-3057.

2. DANKO, Martin - HRDLOVIČ, Pavol - FULUPOVA, A. - CIGÁŇ, M. Fluorescence enhancement of ionic benzotristhiazole based donor-acceptor NLO-phores in polymer matrices. In New Trends in Solar Cells : book of abstracts. - Bratislava : Polymer Institute of SAS, 2016, p. 100-101. ISBN 978-80-970923-9-9.

7.) Mikro- a nanovlákna z prírodných zdrojov na báze sacharidov a bielkovín pripravené elektrostatickým zvlákňovaním. *(Micro- and nanofibers from natural resources on the base of sacharides and proteins prepared by electrospinning.)*

Zodpovedný riešiteľ:	Anita Eckstein
Trvanie projektu:	1.1.2014 / 31.12.2016
Evidenčné číslo projektu:	2/0142/14
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	4 593.00 €

Dosiahnuté výsledky:

V hodnotenom období sa optimalizovali podmienky elektrostatického zvlákňovania syntetických a prírodných polymérov. Vlákenné produkty z celulózy, PVA a ecoflexu modifikované herbicídmi boli pripravované pre poľnohospodárske využitie. Metribuzín ako inhibítor fotosyntézy bol vybraný ako modelový derivát pre túto aplikáciu. Hodvábne vlákna boli pripravené na charakterizáciu,

prípadne ďalšiu modifikáciu pomocou vybraného liečiva známej pod názvom diklofenac. Vlákna boli modifikované fyzikálne, inkorporáciou liečiva do štruktúry vlákna alebo chemicky kovalentnou väzbou na povrch vlákenných vrstiev klik reakciou. Získané materiály boli podrobené štúdiu uvoľňovania liečiva respektíve herbicídu z vlákennej vrstvy, pričom sa zistila maximálna doba uvoľňovania.

Výstupy:

1. ECKSTEIN ANDICSOVÁ, Anita - OPÁLEK, A. - KRONEKOVÁ, Zuzana - KLEINOVÁ, Angela - ŠIŠKOVÁ, Alena. Modification of silk fibrous mats for medical application. In N.I.C.E. 2016: Nature Inspires, Creativity Engineers : 3rd International Conference on Bioinspired and Biobased Chemistry & Materials : abstracts. - Nice, France : IUPAC, 2016, p. 274. Typ:AFG

2. ECKSTEIN ANDICSOVÁ, Anita - OPÁLEK, A. - KRONEKOVÁ, Zuzana - KLEINOVÁ, Angela - ŠIŠKOVÁ, Alena. Preparation of modified silk fibrous mats for medical application. In BIMac 2016: XXII. Bratislava Conference on Macromolecules: Polymers with Tailored Architecture and Properties : programme book and book of abstracts. - Bratislava : Ústav polymérov SAV, 2016, p. 66. ISBN 978-80-89841-01-1. Typ: AFH

3. ŠIŠKOVÁ, Alena - ČÍKOVÁ, Eliška - KRONEKOVÁ, Zuzana - OPÁLEK, A. - MÚDRA, E. - KLEINOVÁ, Angela - *FORRÓ, Klaudia* - ŠPITÁLSKY, Zdenko - OMASTOVÁ, Mária. Preparation and study of drug-loaded electrospun poly(epsilon-caprolactone) nano-fibers. In BYPOS 2016 : 6th Bratislava Young Polymer Scientists Workshop : 13-18 March, 2016 : High Tatras, Slovakia : workshop book. - Bratislava : Young Scientists Council of Polymer Institute of SAS, 2016, p. 113. ISBN 978-80-970923-8-2. Prednáška – Šišková

4. ŠIŠKOVÁ, Alena - KRONEKOVÁ, Zuzana - OPÁLEK, A. - ECKSTEIN ANDICSOVÁ, Anita. Electrospun silk for medical treatment. In Electrospin 2016 : 4th International Conference on Electrospinning 2016 : 28 June – 2 July, 2016, Otranto, Italy: book of abstracts. - Salento, Italy: Universita del Salento, 2016, abstract no. 1309. http://electrospin2016.unisalento.it.

5. ŠIŠKOVÁ, Alena - KRONEKOVÁ, Zuzana - OPÁLEK, A. - KLEINOVÁ, Angela - ECKSTEIN ANDICSOVÁ, Anita. Electrospun nano-fibrous mats for bio-applications. In N.I.C.E. 2016 : Nature Inspires, Creativity Engineers : 3rd International Conference on Bioinspired and Biobased Chemistry & Materials : 16-20. October, 2016, Nice, France: abstracts. - Nice, France : IUPAC, 2016, p. 302.

6. ŠIŠKOVÁ, Alena – KRONEKOVÁ, Zuzana – OPÁLEK, A. – SLÁVIKOVÁ, M. – NOVÁKOVÁ, E. – KRONEK, Juraj – ECKSTEIN-ANDICSOVÁ, Anita. In vitro biocompatibility study of electrospun silk mats and its use as carrier in anti- cancer therapy.Journal of Material Science: Materials in Medicine Submission ID: JMSM-D-16-00597

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:	1.1.2014 / 31.12.2017
Evidenčné číslo projektu:	2/0108/14
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	7 204.00 €

Dosiahnuté výsledky:

Podstatné výsledky sa získali v oblasti štúdia zmien štruktúry elektrovodivých sadzí v kaučukovej matrici počas mechanickej deformácie. Preverili sa najmä závislosti pri cyklickej deformácii pre dve kaučukové matrice, a to SBR a EPDM. Zaujímavé je, že chovanie msa kompozitov s rôznymi matricami sa pomerne výrazne líši, i keď hlavné črty závislostí sú badateľné v oboch prípadoch.
Začali sa experimenty, týkajúce sa prípravy termoplastického škrobu (TPS) rôznymi postupmi a

rôzneho zloženia. Najdôležitejším poznatkom sa javí možnosť úpravy mechanických vlastností TPS kombinácioou viacerých plastifikátorov, pričom dôležitú úlohu hrajú aj podmienky prípravy, najmä teplota.

Výstupy:

1. PORUBSKÁ, M. - BABIĆ, D. - JANIGOVÁ, Ivica - ŠLOUF, M. - JOMOVÁ, K. - CHODÁK, Ivan. The effect of gamma irradiation in air and inert atmosphere on structure and properties of unfilled or glass fibre-reinforced polyamide 6. In Polymer Bulletin, 2016, vol. 73, p. 1775-1794. (1.371 - IF2015). ISSN 0170-0839.

2. IVANIČ, František - JOCHEC-MOŠKOVÁ, Daniela - JANIGOVÁ, Ivica - CHODÁK, Ivan. Physical properties of starch plasticized by a mixture of plasticizers, European Polymer Journal, odoslané

3. CHODÁK, Ivan - IVANIČ, František - OLČÁK, D. - JOCHEC MOŠKOVÁ, Daniela. Optimalization of structure - physical properties relation of plasticized starch. In Bio-Based Polymers and Composites : abstract book. - Budapest, Hungary : Budapest University of Technology and Economics, 2016, p. 18-19.

4. IVANIČ, František - CHODÁK, Ivan. Effect of composition on mechanical properties of thermoplastic starch. In Bio-Based Polymers and Composites : abstract book. - Budapest, Hungary : Budapest University of Technology and Economics, 2016, p. 287-288. poster

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

Zodpovedný riešiteľ:	Ivica Janigová
Trvanie projektu:	1.1.2015 / 31.12.2017
Evidenčné číslo projektu:	1/0122/15
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	3 309.00 €

Dosiahnuté výsledky:

V rámci projektu sa sledoval vplyv UV žiarenia v rozmedzí 0 až 190 dní na termické charakteristiky kyseliny polymliečnej (PLA) a polyhydroxybutyrátu (PHB) metódami termickej analýzy (DSC, TGA a chemiluminiscencia). Výsledky ukázali výraznú zmenu termických charakteristík PLA už po tridsiatich dňoch termického namáhania. Pri PHB nie je ešte meranie ukončené.

Výstupy:

1. JANIGOVÁ, Ivica - RYCHLÝ, Jozef - CSOMOROVÁ, Katarína - RYCHLÁ, Lýdia - FIEDLEROVÁ, Agnesa - ŠLOUF, M. Degradácia Ecoflexu UV žiarením. In Polyméry 2016 : IX. Slovensko - Česká konferencia : program a zborník príspevkov. - Bratislava : Ústav polymérov SAV, 2016, s. 68. ISBN 978-80-89841-00-4.

2. JANIGOVÁ, Ivica - CSOMOROVÁ, Katarína - RYCHLÁ, Lýdia - FIEDLEROVÁ, Agnesa - RYCHLÝ, Jozef - ŠLOUF, M. The effect of UV eadiation on the thermal properties of Ecoflex. In Bio-Based Polymers and Composites : abstract book. - Budapest, Hungary : Budapest University of Technology and Economics, 2016, p. 270-271.

10.) Biodegradovateľné polyméry a ich využitie v oblasti pôdohospodárstva a obalových aplikáciách. *(Biodegradable polymers for agricultural applications and food packaging.)*

Zodpovedný riešiteľ:	Jozef Kollár
Trvanie projektu:	1.1.2014 / 31.12.2016
Evidenčné číslo projektu:	2/0167/14
Organizácia je koordinátorom projektu:	áno

Koordinátor: Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: 5 856.00 €

Dosiahnuté výsledky:

Zamerali sme sa na štúdium degradácie mulčovacej fólie na báze PLA-PHB (poly(lactic acid)-poly(3-hydroxybutyrate)). Ako zmäkčovadlo sa použil acetyl tributyl citrát. Degradácia bola sledovaná v reálnych ako aj v laboratórnych podmienkach. Degradácia vzoriek bola sledovaná pomocou zmeny mólových charakteristík, ako aj zmenou termických a mechanických vlastností. Ožiarené vzorky vykazovali nárast elastického modulu, posun Tg k vyšším teplotám ako aj nárastom kryštalinity. Starnutie bolo sprevádzané takmer zmenou ťahového napätia i predĺženia fólie. Pripravili sa tiež masterbatche na báze PLA-PHB s prídavkom 3% sadzí, ktoré budú po príprave fólie testované z pohľadu degradácie v reálnych i umelých podmienkach.

11.) 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: 1.1.2015 / 31.12.2017
Evidenčné číslo projektu: 2/0163/15
Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: 5 972.00 €

Dosiahnuté výsledky:

V uplynulom období sme pokračovali v syntéze a charakterizácii hydrogélov na báze poly(2-oxazolínov). V uplynulom období sme pripravili nový typ hydrogélov využitím tiol-énovej click reakcie. Takýmto spôsobom sa pripravila knižnica polymérov s rôznou sieťovou hustotou, napučiavaním vo vode ako aj s rôznymi mechanickými vlastnosťami. Taktiež sa potvrdila ich bionezávadnosť v in vitro podmienkach. Taktiež sa pripravil nový typ funkčného biomedicínskeho polyméru s možnosťou prípravy hydrogélov, nanočastíc ako aj biokonjugátov s antizápalovými liečivami. V tomto prípade sa študovala in vitro cytotoxicita, imunomodulačné vlastnosti ako aj internalizácia do buniek.

Výstupy:

1. KRONEKOVÁ, Zuzana - *MIKULEC, Marcel* - PETRENČÍKOVÁ, Nadežda - PAULOVIČOVÁ, E. - PAULOVIČOVÁ, L. - JANČINOVÁ, V. - NOSÁĽ, R. - REDDY, P. S. - SHIMOGA, G. D. - CHORVÁT, D. Jr. - KRONEK, Juraj. Ex vivo and in vivo studies on the cytotoxicity and immunomodulative properties of poly(2-isopropenyl-2-oxazoline) as a new type of biomedical polymer. In Macromolecular Bioscience, 2016, vol. 16, p. 1200-1211. (3.680 - IF2015).

2. ZAHORANOVÁ, Anna - KRONEKOVÁ, Zuzana - ZAHORAN, M. - CHORVÁT, D. Jr. - JANIGOVÁ, Ivica - KRONEK, Juraj. Poly(2-oxazoline) hydrogels crosslinked with aliphatic bis(2-oxazoline)s: Properties, cytotoxicity, and cell cultivation. In Journal of Polymer Science. Part A.Polymer Chemistry, 2016, vol. 54, p. 1548-1559. (3.114 - IF2015).

12.) 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: 1.1.2015 / 31.12.2017
Evidenčné číslo projektu: 2/0156/15
Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: 5 826.00 €

Dosiahnuté výsledky:

V roku 2016 sme sa zamerali na hodnotenie biokompatibility polymérov, hydrogélov a kompozitných materiálov, ale naše štúdium sme rozšírili aj o analýzu imunomodulatívnych vlastností jedného typu polyméru, konkrétne poly(2-isopropenyl-2-oxazolínu), (PIPOx). Ukázalo sa, že nové typy hydrogélov na báze 2-oxazolínov sú biokompatibilné a vhodné na kultiváciu buniek [1]. PIPOx, ako nový typ polyméru sa ukázal byť veľmi sľubný materiál pre biomedicínske aplikácie, pretože je netoxický až do doposiaľ použitej najvyššej koncentrácie 20 mg/mL. Zároveň však tento polymér vykazuje imunomodulatívne vlastnosti in vitro a aj ex vivo [2]. Cieľom tohto projektu je aj štúdium cytotoxicity zwitterionových polymérov a ich vplyv na zvyšovanie biokompatibility povrchov. Preto sme použili sulfobetaíny na modifikáciu mikročastíc oxidu železitého a preukázali ich netoxickosť ako aj ich funkčnosť in vitro [3]. V neposlednom rade sme sa zamerali aj na kompozitné materiály založené na chitozáne a nanočatíc striebra modifikované extraktom z rebarbory. Tieto materiály sa líšili cytotoxicitou v závislosti od prítomnoti nanočastíc striebra a mali aj protirakovinové účinky ako ukázane na rakovinových bunkách (HELA)[4,5]. Výsledky našej práce boli prezentované aj na mnohých domácich a zahraničných konferenciách [5-10].

Výstupy:

1. ZAHORANOVÁ, Anna - KRONEKOVÁ, Zuzana - ZAHORAN, M. - CHORVÁT, D. Jr. - JANIGOVÁ, Ivica - KRONEK, Juraj. Poly(2-oxazoline) hydrogels crosslinked with aliphatic bis(2-oxazoline)s: Properties, cytotoxicity, and cell cultivation. In Journal of Polymer Science. Part A.Polymer Chemistry, 2016, vol. 54, p. 1548-1559. (3.114 - IF2015). ISSN 0887-624X.

2. KRONEKOVÁ, Zuzana - *MIKULEC, Marcel* - PETRENČÍKOVÁ, Nadežda - PAULOVIČOVÁ, E. - PAULOVIČOVÁ, L. - JANČINOVÁ, V. - NOSÁĽ, R. - REDDY, P. S. - SHIMOGA, G. D. - CHORVÁT, D. Jr. - KRONEK, Juraj. Ex vivo and in vivo studies on the cytotoxicity and immunomodulative properties of poly(2-isopropenyl-2-oxazoline) as a new type of biomedical polymer. In Macromolecular Bioscience, 2016, vol. 16, p. 1200-1211. (3.680 - IF2015). ISSN 1616-5187.

3. MRLÍK, M.– ILČÍKOVÁ, Markéta – CVEK, M. – PAVLÍNEK, V. – ZAHORANOVÁ, Anna – KRONEKOVÁ, Zuzana – *KASÁK, Peter*. Carbonyl iron coated with sulfobetaine moiety as a biocompatible system and the magnetorheological performance of its silicone oil suspensions. RSC Adv.,2016, 6, p. 32823 (3.84 - IF2015).

4. REDDY P. R. - SAHA N. - KRONEKOVÁ Zuzana - SLÁVIKOVÁ M. - SAHA P. Chitosan based silver nanocomposites: A novel biomaterial for life science applications. The International Journal of Polymeric Materials and Polymeric Biomaterials. - odoslané

5. REDDY, R. P. - SAHA, N. - SHIMOGA, G. - KRONEKOVÁ, Zuzana - SAHA, P. Chitosan based silver nanocomposites: A novel biomaterial for life science applications. In Bio-Based Polymers and Composites : abstract book. - Budapest, Hungary : Budapest University of Technology and Economics, 2016, p. 179-180.

6. KRONEK, Juraj – KRONEKOVÁ, Zuzana – ŠRÁMKOVÁ, Petra – ZAHORANOVÁ, Anna – PETRENČÍKOVÁ, Nadežda – MRLÍK, M. – MOSNÁČEK, Jaroslav. Functional polymers based on unsaturated 2-oxazolines:from thermosensitive polymers to hydrogels. In ACS Symposium, August 21-26, 2016, Philadelphia.

7. KRONEKOVÁ, Zuzana - PAULOVIČOVÁ, E. - PAULOVIČOVÁ, L. - CHORVÁT, D. Jr. - KRONEK, Juraj. Cytotoxicity and immunomodulative properties of poly(2-isopropenyl-2-oxazoline) as new type of biomedical polymers. In BYPOS 2016 : 6th Bratislava Young Polymer Scientists Workshop : March 13th-18th, 2016 : High Tatras, Slovakia : workshop book. - Bratislava : Young Scientists Council of Polymer

Institute of SAS, 2016, p. 105. ISBN 978-80-970923-8-2.

8. KRONEKOVÁ, Zuzana - PETRENČÍKOVÁ, Nadežda - TULINSKÁ, J. - LÍŠKOVÁ, A. - KURICOVÁ, M. - VÁVRA, I. - KRONEK, Juraj. Aggregation behavior and in vitro biocompatibility study of statistical copolymers based on 2-oxazolines. In BIMac 2016 : XXII. Bratislava Conference on Macromolecules : Polymers with Tailored Architecture and Properties : programme book and book of abstracts. - Bratislava : Ústav polymérov SAV, 2016, p. 69. ISBN 978-80-89841-01-1.

9. KRONEKOVÁ, Zuzana - ZAHORANOVÁ, Anna - ŠRÁMKOVÁ, Petra - PETRENČÍKOVÁ, Nadežda - SMOLÍČEK, M. - KRONEK, Juraj Functional poly(2-oxazolines) for biomedical applications. In Brochure of ABIOG Partners : 2th Meeting of ABIOG Project Managements Committee & Workshop. - Bratislava, Slovak Republic : Polymer Institute of SAS, 2016, p. 17. ISBN 978-80-89841-02-8.

10. KRONEKOVÁ, Zuzana - PELACH, M. - MAZANCOVÁ, Petra - UHELSKÁ, Lucia - TREĽOVÁ, Dušana - ŠIFFALOVIČ, P. - MAJKOVÁ, E. - LACÍK, Igor Confocal raman spectroscopy: A powerful tool for microcapsules characterization. In XXIV International Conference on Bioencapsulation : Lisbon, Portugal, September 21-23, 2016. - Lisbon, Portugal : Bioencapsulation Research Group, 2016, p. 30-31.

13.) Kinetika a bioaplikácie zwitteriónových polymérov. *(Kinetics and bioapplications of zwitterionic polymers.)*

Zodpovedný riešiteľ:	Igor Lacík
Trvanie projektu:	1.1.2014 / 31.12.2016
Evidenčné číslo projektu:	2/0198/14
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	13 115.00 €

Dosiahnuté výsledky:

Rok 2016 bol plodný z pohľadu publikačných výstupov, ale hlavne z pohľadu získaných výsledkov v rôznych polymerizačných systémov. Tieto výstupy odrážajú naše významné postavenie vo svete v tematike polymerizácie vo vodnej fáze a kontinuálny záujem BASF SE v Ludwigshafene o túto tému deklarovanú podpísaným kontraktom do roku 2018. Výstupy sa týkajú skompletizovania mechanizmu polymerizácie akrylamidu a kyseliny akrylovej, ich kopolymerizácie, sulfobetaínov a z nich vytvorených hydrogélov, a presnosti PLP-SEC metodiky. IL mal 2 pozvané prednášky na medzinárodných konferenciách.

Výstupy:

1. LACÍK, Igor - *SOBOLČIAK, Patrik - STACH, Marek* - CHORVÁT, D. Jr. - *KASÁK, Peter*. Propagation rate coefficient for sulfobetaine monomers by PLP-SEC. In Polymer : the International Journal for the Science and Technology of Polymers, 2016, vol. 87, p. 38-49. (3.586 - IF2015). ISSN 0032-3861.

2. LACÍK, Igor - CHOVANCOVÁ, Anna - UHELSKÁ, Lucia - PREUSSER, C. - HUTCHINSON, R. A. - BUBACK, M. PLP-SEC studies into the propagation rate coefficient of acrylamide radical polymerization in aqueous solution. In Macromolecules, 2016, vol. 49, p. 3244-3253. (5.554 - IF2015). ISSN 0024-9297.

3. PALMIERO, U. C. - CHOVANCOVÁ, Anna - CUCCATO, D. - STORTI, G. - LACÍK, Igor - MOSCATELLI, D. The RAFT copolymerization of acrylic acid and acrylamide. In Polymer : the International Journal for the Science and Technology of Polymers, 2016, vol. 98, p. 156-164. (3.586 - IF2015). ISSN 0032-3861.

4. PREUSSER, C. - CHOVANCOVÁ, Anna - LACÍK, Igor - HUTCHINSON, R. A. Modeling the radical batch homopolymerization of acrylamide in aqueous solution. In Macromolecular Reaction Engineering, 2016, vol. 10, p. 490-501. (1.256 - IF2015). ISSN 1862-832X.

5. WITTENBERG, N. F. G. - PREUSSER, C. - KATTNER, H. - *STACH, Marek* - LACÍK, Igor - HUTCHINSON, R. A. - BUBACK, M. Modeling acrylic acid radical polymerization in aqueous solution. In Macromolecular Reaction Engineering, 2016, vol. 10, p. 95-107. (1.256 - IF2015). ISSN 1862-832X.

6. NIKITIN, A. N. - LACÍK, Igor - HUTCHINSON, R. A. A 3D simulation investigation of the influence of temperature increases on the accuracy of propagation rate coefficients determined by pulsed-laser polymerization. In *Macromolecules*, 2016, vol. 49, p. 9320-9335. (5.554 - IF2015). ISSN 0024-9297..

7. *KASÁK, Peter* - MOSNÁČEK, Jaroslav - DANKO, Martin - *KRUPA, Igor* - HLOUŠKOVÁ, Gabriela - CHORVÁT, D. Jr. - KOUKAKI, M. - KARAMANOU, S. - ECONOMOU, A. - LACÍK, Igor. A polysulfobetaine hydrogel for immobilization of a glucose-binding protein. In RSC Advances, 2016, vol. 6, p. 83890-83900. (3.289 - IF2015). ISSN 2046-2069.

14.) Skúmanie povrchových, adhéznych a antibakteriálnych vlastností vybraných medicinálnych polymérov upravených nízkoteplotnou plazmou. *(Investigation of surface, adhesive and antibacterial properties of selected medicinal polymers modified by low-temperature plasma.)*

Zodpovedný riešiteľ:	Igor Novák
Trvanie projektu:	1.1.2014 / 31.12.2016
Evidenčné číslo projektu:	2/0199/14
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	2 825.00 €

Dosiahnuté výsledky:

Nízkohustotný polyetylén (LDPE) a polymliečna kyselina (PLA) vo forme filmov boli modifikované rádiofrekvenčnou plazmou v dvoch procesných plynoch, vo vzduchu a v argóne. Na voľné radikály, ktoré vznikli na plazmou modifikovanom povrchu polyméru sa očkovali vybrané monoméry. Ako monomér vhodný na očkovanie LDPE a PLA bola odskúšaná kyselina akrylová, alylamín a 2-hydroxyetylakrylát. Na očkovaný povrch PLA boli imobilizované vybrané antibakteriálne látky (D-glukozamín a kyselina alginová). Antibakteriálne modifikované povrchy LDPE a PLA boli skúmané z hľadiska povrchových a bakteriostatických vlastností. Študovala sa účinnosť antibakteriálnej úpravy povrchov LDPE a PLA proti vybraným G+ a G- bakteriálnym kmeňom. Vyššia bakteriostatická účinnosť bola dosiahnutá pre polyméry upravené rádiofrekvenčnou plazmou v argóne v porovnaní so vzduchom. Bakteriostatický efekt bol pre povrchovo modifkované polymérne povrchy vyšší pre D-glukozamín ako pre kyselinu alginovú. Boli tiež skúmaná adhézia a proliferácia myších embryonálnych fibroblastov na povrchu nemodifikovaných a modifikovaných PLA fólií s cieľom overenia použiteľnosti týchto biomateriálov v regeneratívnej medicine, resp. pre účely tkanivového inžinierstva.

Výstupy:

1. PRACHÁR, Jozef - NOVÁK, Igor - KLEINOVÁ, Angela - GEMEINER, P. - OMASTOVÁ, Mária - CHMELA, Štefan - BORSIG, Eberhard. Plasma grafting of polypropylene with organosilanes and its aalkylamine treatment. In Vacuum, 2016, vol. 127, p. 38-44. (1.558 - IF2015). (2016 - Current Contents). ISSN 0042-207X.

2. SWILEM, A. E. - LEHOCKÝ, M. - HUMPOLÍČEK, P. - KUCEKOVÁ, Z. - JUNKAR, I. - MOZETIČ, M.- HAMED, A. A. - NOVÁK, Igor. Developing a biomaterial interface based on poly(lactid acid) via plasma-assisted covalent anchorage of D-glucosamine and its potential for tissue regeneration. In Colloids and Surfaces B - Biointerfaces, 2016, vol. 148, p. 59-65. (3.902 - IF2015). (2016 - Current Contents, WOS, SCOPUS). ISSN 0927-7765.

3. NOVÁK, Igor - KARBASSI, E. - ASADINEZHAD, A. - LEHOCKÝ, M. - VESEL, A. - POPELKA, *Anton* - PRACHÁR, Jozef. Antibacterial assessment of polyethylene modified by plasma and alginic acid. In Polyméry 2016 : IX. Slovensko - Česká konferencia : program a zborník príspevkov. - Bratislava : Ústav polymérov SAV, 2016, s. 42-43. ISBN 978-80-89841-00-4.

4. NOVÁK, Igor - *POPELKA, Anton* - PRACHÁR, Jozef - CHODÁK, Ivan - ŽIGO, Ondrej. Antibakteriálna

modifikácia polyolefínov účinkom nízkoteplotnej plazmy = Antibacterial modification of polyolefins by the effect of low-temperature plasma. In Sborník IX. konference Pigmenty a pojiva. - Pardubice, ČR : Chemagazín, 2016, p. 22 - 25. ISBN 978-80-906269-1-1.

15.) 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:	1.1.2014 / 31.12.2017
Evidenčné číslo projektu:	2/0149/14
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	18 700.00 € + 1 974.00 €

Dosiahnuté výsledky:

Boli pripravené dva typy kompozitov na báze styrén-butadiénového kaučuku (SBR) plneného uhlíkovými nanotrubičkami (CNT) a sadzami (CB). Podrobne sa preštudovala ich morfológia a elektrická vodivosť. Porovnali sa senzorické odozvy týchto materiálov na prítomnosť pár rôznych organických rozpúšťadiel. Kompozity obsahovali rôznu koncentráciu plniva a boli zosieťované. Pomocou dielektrickej relaxačnej spektroskopie sa stanovila elektrická perkolácia pre oba typy kompozitov, pretože kompozity tesne nad perkoláciou sú najvhodnejšie na senzorické odozvy. Na základe napučiavacích experimentov s viacerými rozpúšťadlami sa vybrali tri: toluén, tetrahydrofurán a n-hexán. Pozorovali sa veľmi intenzívne a rýchle odozvy, v niektorých prípadoch odozvy dosahovali limit našej prístrojovej zostavy (príliš vysoké odpory). SBR/CB kompozity reagovali oveľa rýchlejšie v prípade všetkých troch plynov v porovnaní SBR/CNT kompozitmi. Keďže všetky pripravené SBR kompozity boli zosieťované, nepodliehali znehodnoteniu vplyvom organických rozpúšťadiel a preto je možné ich použiť opakovane ako ochranné alarmy alebo jednoduché senzory na prítomnosť organických rozpúšťadiel a na monitoring priemyselných priestorov.

Výstupy:

1. *TABAČIAROVÁ, Jana - KRAJČI, Juraj* - PIONTECK, J. - REUTER, U. - OMASTOVÁ, Mária - MIČUŠÍK, Matej. Styrene butadiene rubber/carbon filler-based vapor sensors. In Macromolecular Chemistry and Physics, 2016, vol. 217, p. 1149-1160. (2.495 - IF2015). ISSN 1022-1352.

2. EVGIN, T. - KOCA, H. D. - HORNY, N. - TURGUT, A. - TAVMAN, I. H. - CHIRTOC, M. - OMASTOVÁ, Mária - NOVÁK, Igor. Effect of aspect ratio on thermal conductivity of high density polyethylene/multi-walled carbon nanotubes nanocomposites. In Composites. Part A.Applied science and manufacturing, 2016, vol. 82, p. 208-213. ISSN 1539-835X.

3. KRIPOTOU, S. - SOVATZOGLOU, S. - PANDIS, Ch. - KULIČEK, Jaroslav - MIČUŠÍK, Matej - OMASTOVÁ, Mária - KYRITSIS, A. - KONSTA, A. - PISSIS, P. Effects of CNT inclusions on structure and dielectric properties of PVDF/CNT nanocomposites. In Phase Transitions, 2016, vol. 89, no.7-8, p. 717-730. (0.858 - IF2015). ISSN 0141-1594.

16.) Nanoštrukturované polyméry a nanoštruktúra v polyméroch. *(Nanostructured polymers and polymer nanostructure.)*

Zodpovedný riešiteľ:	Dušan Račko
Trvanie projektu:	1.1.2013 / 31.12.2016
Evidenčné číslo projektu:	2/0068/13
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV

Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: 701.00 €
Dosiahnuté výsledky:
V nadväznosti na dosiahnuté výsledky pri modelovaní hviezdicových polymérov uväznených v idealistickom válcovom kanáli sme zostavili realistickejší model kanálov. Za týmto účelom sme upravili softvérový balík VORO++ na generovanie periodických voronoiovských sietí. Voronoiské členenie priestoru dobre zodpovedá štruktúre agarózového gélu, ktorý sa používa pri chromatografii DNA. Doterajšie simulácie ukázali komplexné správanie tvorbou sponiek, vypuklín a únikov ramien do štruktúry gélu mechanizmom čiastočne pozorovaným pri idealistickom kanáli. Doterajšie výsledky ukázali zaujímavý problém, ktorý môže byť námetom na ďalší projekt VEGA.

17.) 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: 1.1.2015 / 31.12.2018
Evidenčné číslo projektu: 2/0094/15
Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: 5 050.00 €
Dosiahnuté výsledky:
i) In silico dizajn prototypu
ii) Syntéza stavebných blokov a ich oligomerizácia do vyšších oligomérov (nie však do finálnej dĺžky)
iii) Príprava polymérneho komponentu plánovaného na konjugáciu
iv) Prvotné kvantovo-chemické výpočty potrebné pre parametrizáciu MD silového poľa
v) Príprava liekového nosiča na báze chitozánu (zatiaľ neúspešná stabilizácia pre aplikáciu pri pH 7.4)
vi) Charakterizácia a in vitro testovanie liekových nosičov na báze

Výstupy:

1. NÉMETHOVÁ, Veronika – RÁZGA, Filip. Overexpression of ABCB1 as predicition marker for CML: How close we are to translation into clinics? Leukemia. 2017; vol. 31, p. 266-267

2. RÁZGA, Filip - *VNUKOVÁ, Dominika* - NÉMETHOVÁ, Veronika - MAZANCOVÁ, Petra - LACÍK, Igor. Preparation of chitosan-TPP-sub-micron particles: Critical evaluation and derived recommendations. In Carbohydrate Polymers, 2016, vol. 151, p. 488-499

3. NÉMETHOVÁ, Veronika – BULIAKOVÁ, B. – MAZANCOVÁ, Petra – BÁBELOVÁ, A – ŠELC, M – MORAVČÍKOVÁ, Daaniela – KLEŠČÍKOVÁ, Lucia – URSÍNYOVÁ, M – GÁBELOVÁ, A – RÁZGA, Filip. Intracellular uptake of magnetite nanoparticles: a focus on physico-chemical characterization and interpretation of in vitro data. Mater Sci Eng C Mater Biol Appl. 2017; vol. 70, p. 161-168

4. RÁZGA, Filip – NÉMETHOVÁ, Veronika. Gene expression patterns as predictive biomarkers in hemato-oncology: Principal hurdles on the road to the clinic. Haematologica. 2016; vol. 102, p. e31-32

5. MAZANCOVÁ, Petra – NÉMETHOVÁ, Veronika – LACÍK, Igor – RÁZGA, Filip. Chitosan-based particles: The (forgotten) interplay between process, properties and performance. Mater Sci Eng C Mater Biol Appl. 2016; vol. 71, p. 570-571

6. 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. Nanomedicine. 2016; vol. 13, p. 69-82

7. RÁZGA, Filip – NÉMETHOVÁ, Veronika. A method for altering the functional state of any mRNA allowing its selective and specific recognition. PCT/SK2016/060002

8. RÁZGA, Filip – NÉMETHOVÁ, Veronika. Prognostic value of ABCB1 overexpression in predicting outcome of CML patients: Where are we after a decade? XVIII. Slovensko-Český hematologický a transfuziologický zjazd. 20-22 October 2016, Bratislava, Slovak Republic, Interná medicína. 2016; S7, p. 25

9. RÁZGA, Filip – NÉMETHOVÁ, Veronika – MAZANCOVÁ, Petra – BULIAKOVÁ, B. – BÁBELOVÁ, A. – ŠELC, M. – GÁBELOVÁ, A. Magnetite nanoparticles in biomedicine: Critical role of particle characterization in interpretation of biological data. XXV. Biochemicky sjezd. 13-16 September 2016, Prague, Czech Republic, Book of Abstracts, p. 85

10. BULIAKOVÁ, B. – ŠELC, M – BÁBELOVÁ, A – NÉMETHOVÁ, Veronika – RÁZGA, Filip – GÁBELOVÁ, A. Genotoxicity of surface-modified magnetite nanoparticles raises concerns about their biosafety. XXV. Biochemicky sjezd. 13-16 September 2016, Prague, Czech Republic, Book of Abstracts, p. 225

11. MAZANCOVÁ, Petra – NÉMETHOVÁ, Veronika – RÁZGA, Filip – LACÍK, Igor. Controlled preparation and stabilization of chitosan/TPP sub-micron particles. XXIV International Conference on Bioencapsulation. 21-23 September 2016, Lisbon, Portugal, Book of Abstracts, p. 142-143

12. MAZANCOVÁ, Petra – RÁZGA, Filip – *VNUKOVÁ, Dominika* – NÉMETHOVÁ, Veronika – LACÍK, Igor. Lessons from TPP-mediated crosslinking of chitosan. Polymery. 8-10 June 2016, Stará Lesná, Slovak Republic, Book of Abstracts, p. 26-27

13. RÁZGA, Filip – NÉMETHOVÁ, Veronika – MAZANCOVÁ, Petra – BULIAKOVÁ, B. – BÁBELOVÁ, A. – ŠELC, M. – GÁBELOVÁ, A. Magnetite nanoparticles for biomedical applications: Role of particle characterization. Polymery. 8-10 June 2016, Stará Lesná, Slovak Republic, Book of Abstracts, p. 23

18.) Oxidačné a hydrolytické starnutie celulózy ako dôležitý faktor zmien ich horľavosti. *(Oxidative and hydrolytic ageing of cellulose derivatives as an important factor of flammability changes.)*

Zodpovedný riešiteľ:	Jozef Rychlý
Trvanie projektu:	1.1.2014 / 31.12.2016
Evidenčné číslo projektu:	2/0161/14
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	3 583.00 €

Dosiahnuté výsledky:

Celulóza v zmesných alebo kompozitných systémoch pôsobí ako iniciátor vznietenia. Ako príklad možno uviesť priebehy vznietenia a horenia celulózy v zmesi s polyetylénom, kedy sa čas do vznietenia posúva výrazne k nižším časom. Rovnako pôsobí celulóza i v dreve. Preto pri dlhodobom starnutí materiálov, ktoré obsahujú celulózu je potrebné sa okrem iného venovať najmä zmenám v dlhodobých vlastnostiach celulózy vo vzťahu k požiarnemu riziku.

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

Zodpovedný riešiteľ:	Zdenko Špitálsky
Trvanie projektu:	1.1.2016 / 31.12.2019
Evidenčné číslo projektu:	2/0093/16
Organizácia je koordinátorom projektu:	áno

Koordinátor: Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: 11 945.00 €

Dosiahnuté výsledky:

Pripravila sa séria grafénov redukovaných z nevodivého grafén oxidu rôznymi redukčnými chemickými činidlami (OH, LiAlH4, NaBH4, hydrazín a hydrochinon). Redukované grafény boli porovnané rôznymi metódami (XPS, UV-Vis, Ramanova spektroskopia, TGA a BDS) a bola vyhodnotená najvýhodnejšia redukcia. Okrem toho sa pripravili koloidy grafénov elektrochemickou exfoliáciou do vodneho prostredia. Z tohto materiálu sa nakoniec začali pripravovať polymérne kompozity, ktoré sa v súčasnosti testujú.

Výstupy:

1. MARKOVIĆ, Zoran M. - ŠPITÁLSKY, Zdenko - MIČUŠÍK, Matej - DAKIC, I. - MILENKOVIC, M. - TODOROVIC-MARKOVIĆ, B. M. - BUDIMIR, M. M. - TRAJKOVIC, V. S. In vitro comparison of antibacterial activity of graphene, graphene oxide and carbon nanotube. In Graphene Week 2016 : abstract book. - Warsaw, Poland : Graphene Flagship, 2016, abstract no. 3348041. Názov z obrazovky. Požaduje sa Adobe Acrobat. Dostupné na internete: <www.graphene-glagship.eu>.

2. MARKOVIĆ, Zoran M. - ŠPITÁLSKY, Zdenko - MIČUŠÍK, Matej - BUDIMIR, M. D. - KEPIĆ, D. P. - HOLZLAJTNER-ANTUNOVIĆ, I. D. - MARINOVIĆ-CINCOVIĆ, M. T. - SPASOJEVIĆ, V. D. - PERUŠKO, D. B. - TODOROVIĆ-MARKOVIĆ, B. M. Comparative study of electrochemically exfoliated graphene electrodes. In New Trends in Solar Cells : book of abstracts. - Bratislava : Polymer Institute of SAS, 2016, p. 78-79. ISBN 978-80-970923-9-9.

3. ŠPITÁLSKY, Zdenko - MIČUŠÍK, Matej - BUGÁROVÁ, Nikola - JOCHEC MOŠKOVÁ, Daniela - CSOMOROVÁ, Katarína - MARKOVIĆ, Zoran M. - BODIK, M. Reduction of graphene oxide to graphite. In New Trends in Solar Cells : book of abstracts. - Bratislava : Polymer Institute of SAS, 2016, p. 118-119. ISBN 978-80-970923-9-9.

4. MARKOVIĆ, Zoran M. - BUDIMIR, M. D. - KEPIĆ, D. P. - HOLCLAJTNER-ANTUNOVIĆ, I. D. - MARINOVIĆ-CINCOVIĆ, M. T. - DRAMIĆANIN, M. D. - SPASOJEVIĆ, V. D. - PERUŠKO, D. B. - ŠPITÁLSKY, Zdenko - MIČUŠÍK, Matej - PAVLOVIĆ, V. B. - TODOROVIĆ-MARKOVIĆ, B. M. Semi-transparent, conductive thin films of electrochemical exfoliated graphene. In RSC Advances, 2016, vol. 6, p. 39275-39283. (3.289 - IF2015). ISSN 2046-2069.

20.) 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: 1.1.2016 / 31.12.2018
Evidenčné číslo projektu: 2/0059/16
Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: 2 066.00 €

Dosiahnuté výsledky:

Prvý rok riešenia projektu bol venovaný príprave alginátových mikrosfér interným gélovaním v emulzii v závislosti od nastavenia podmienok prípravy. Boli testované rôzne faktory, ktoré môžu mať vplyv na samotnú prípravu a finálne vlastnosti mikrosfér, ako napr. koncentrácia alginátu sodného vo východiskovom roztoku, typ pufrovacieho roztoku, čas acidifikácie, resp. rýchlosť miešania reakčnej zmesi. Taktiež sme sa venovali objasneniu vzniku sférických nehomogenít

a CO_2 bublín vo vnútri pripravených mikrosfér, ako aj hľadaniu spôsobu minimalizácie výskytu nezreagovaných $CaCO_3$ podielov. Z množstva uskutočnených experimentov boli následne vyselektované podmienky, pomocou ktorých bolo možné prispraviť mikrosféry s požadovanými vlastnosťami ako veľkosť a jej distribúcia, tvar, a (ne)prítomnosť defektov. Cieľom ďalšieho obdobia je scale-up celého procesu a príprava väčšieho množstva alginátových mikrosfér za účelom detailného štúdia ich vlastností s využitím rôznych analytických metód (optická mikroskopia na stanovenie distribúcie veľkosti, Texture Analyzer na stanovenie kompresnej sily, evaluácia stability a homogenity pomocou rupture testu a osmo-testu, konfokálna ramanova mikroskopia (CRM) na stanovenie distribúcie alginátu sodného v mikrosférach, atď.).

Výstupy:

1. UHELSKÁ, Lucia – TREĽOVÁ, Dušana – RÁZGA, Filip – NÉMETHOVÁ, Veronika – MAZANCOVÁ, Petra – *MIHÁLOVÁ, Andrea* – KRONEKOVÁ, Zuzana – MARCHESE, E. – McGARRIGLE, J. – OMAMI, M. – OBERHOLZER, J. – LACÍK, Igor. SA-CS-PMCG microcapsules aimed for transplantation of encapsulated pancreatic islets into different animal models towards clinical trials. Bratislava Young Polymer Scientist Workshop 2016, 14 March, Ždiar, Slovensko, prednáška CL-1-8, Abstract Book p.51.

2. TREĽOVÁ, Dušana – UHELSKÁ, Lucia – RÁZGA, Filip – NÉMETHOVÁ, Veronika – MAZANCOVÁ, Petra – KRONEKOVÁ, Zuzana – *MIHÁLOVÁ, Andrea* – ROKSTAD, A. M. – MARCHESE, E. – McGARRIGLE, J. – OMAMI, M. – OBERHOLZER, J. – LACÍK, Igor. SA-CS-PMCG microcapsule concept: preparation, characterization, performance. 24th International Conference on Bioencapsulation 2016, 21 September, Lisbon, Portugal, poster P-05, Abstract Book p.104.

3. UHELSKÁ, Lucia – TREĽOVÁ, Dušana – RÁZGA, Filip – NÉMETHOVÁ, Veronika – MAZANCOVÁ, Petra – KRONEKOVÁ, Zuzana – *MIHÁLOVÁ, Andrea* – MARCHESE, E. – McGARRIGLE, J. – OMAMI, M. – OBERHOLZER, J. – LACÍK, Igor. Novel PMCG microcapsules designed for pancreatic validation using different animal models. IX. Slovensko-Česká konferencia Polyméry 2016, 8. jún, Stará Lesná, Slovensko, prednáška L-11, Abstract Book p.31.

Programy: APVV

21.) 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:	1.7.2016 / 30.6.2020
Evidenčné číslo projektu:	APVV- 15 – 0227
Organizácia je koordinátorom projektu:	nie
Koordinátor:	
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 4520 €

Dosiahnuté výsledky:

Charakterizovali sa hydrogélové imobilizačné systémy pre imobilizáciu katalyzátorov fyzikálno-chemickými metódami.

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

Zodpovedný riešiteľ:	Peter Cifra
Trvanie projektu:	1.7.2016 / 30.6.2020
Evidenčné číslo projektu:	APVV-15-0323
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV 13 916.00 €

Dosiahnuté výsledky:

Uzavreli sme simulačné štúdie, interpretáciu a porovnanie stiesnenia lineárnych a cyklických makromolekúl pri prechode geometrie od kanálov ku úzkym, takmer dvojrozmerným kanálom v tvare štrbiny. Aj cyklické aj lineárne makromolekuly sa vystierajú viac v štrbinových kanáloch a tento efekt je ešte zosilnený v stesnených cykloch. V stesnených cykloch sme pozorovali nezvyčajne zvýšený efekt vylúčeného objemu, kým lineárne reťazce bežných, nie príliš vysokých dĺžok, sa správajú ideálne. Podobne, zatiaľ čo zmena správania reťazcov pri prechode od geometrie úzkej štrbiny ku širšiemu kanálu je pri rozširovaní kanála rýchla pre lineárne reťazce, v cykloch zostáva správanie so silnejším vystieraním dôsledkom prítomnosti zvýšeného vylúčeného objemu aj v širších štrbinách. Tieto výsledky budú mať implikácie pre jednomolekulové charakterizácie lineárnej a makrocyklickej DNA v nanofluidných zariadeniach.

Výstupy:

1. BENKOVÁ, Zuzana - NÁMER, Pavol - CIFRA, Peter. Comparison of a stripe and slab confinement for ring and linear macromolecules in nanochannel. In Soft Matter, 2016, vol. 12, p. 8425-8439. (3.798 - IF2015). ISSN 1744-683X.

2. BHANDARY, D. - BENKOVÁ, Zuzana - CORDEIRO, M. N. D. S. - SINGH, J. K. Molecular dynamics study of wetting behavior of grafted thermo-responsive PNIPAAm brushes. In Soft Matter, 2016, vol. 12, p. 3093-3102. (3.798 - IF2015). ISSN 1744-683X.

3. BENKOVÁ, Zuzana - NÁMER, Pavol - CIFRA, Peter. Linear and ring DNA in nanochannels under stripe and slab confinement, Polymers with spatial and mechanical constraints. Workshop, 7. -9.07. 2016, Benátky, Taliansko, bez zborníka, pozvaná prednáška PC

4. BENKOVÁ, Zuzana - NÁMER, Pavol - CIFRA, Peter. Simulation of linear and ring DNA in nanochannels, Dedicated parallel machines a breakthrough in computation ARUZ. Workshop 2016, 1. 12.-3, 12. 2016, Lodz, Poland, abstrakt v zborníku, p.21-22, ISBN 978-83-7283-792-9, pozvaná prednáška PC

23.) Technológia prípravy tenkých vrstiev karbidu kremíka: Výskum a vývoj technológií prípravy tenkých vrstiev karbidu kremíka pre aplikácie v solárnych článkoch a v tenkovrstvových súčiastkach. *(Silicon carbide thin film technologies: Research and development of silicon carbide thin film technologies for application in solar cells and thin film devices.)*

Zodpovedný riešiteľ:	Jozef Huran
Zodpovedný riešiteľ v organizácii SAV:	Angela Kleinová
Trvanie projektu:	1.10.2013 / 31.12.2016
Evidenčné číslo projektu:	APVV-0443-12
Organizácia je koordinátorom projektu:	nie
Koordinátor:	
Počet spoluriešiteľských inštitúcií:	0

Čerpané financie: APVV: 3740 €

Dosiahnuté výsledky:

V uplynulom roku sa pokračovalo v charakterizácii materiálov upravených nanesením vrstiev karbidu vápnika pomocou FTIR spektroskopie, pričom sa porovnávali materiály pripravené v rôznych podmienkach. Získané výsledky zloženia povrchových vrstiev budú využité pri výbere materiálov pre použitie v nepriaznivom prostredí.

Výstupy:

1. HURAN, J. - BOHÁČEK, P. - SASINKOVÁ, V. - KLEINOVÁ, Angela - MIKOLÁŠEK, M. - KOBZEV, A.P. - HRUBČÍN, L. - ARBET, J. - SEKÁČOVÁ, M. Silicon carbide thin films deposited by PECVD technology for applications in photoelectrochemical water splitting devices. In ASDAM 2016 : the 11th International Conference on Advanced Semiconductor Devices and Microsystems. Eds. Š. Haščík, J. Dzuba, G. Vanko. - IEEE, 2016, p. 215-218. ISBN 978-1-5090-3081-1.

2. HURAN, J. - BALALYKIN, N.I. - HAŠČÍK, Š. - FESHCHENKO, A.A. - KOBZEV, A.P. - SASINKOVÁ, V. - KLEINOVÁ, Angela - ARBET, J. Dry etching of phosphorus doped SiC thin films prepared by PECVD technology for transmission photocathode. In ADEPT 2016 : Proceedings of the 4th International Conference on Advances in Electronic and Photonic Technologies, held in Tatranská Lomnica, High Tatras, Slovakia, June 20-23, 2016. Eds. J. Kováč, jr. et al. - Žilina : University of Žilina, 2016, p. 35-38. ISBN 978-80-554-1226-9.

3. HURAN, J. - SASINKOVÁ, V. - KLEINOVÁ, Angela. Silicon carbide thin films deposited by PECVD technology for harsh environment applications. In Solid State Chemistry 2016 : 12th International Conference. - Prague, Czech Republic : Institute of Inorganic Chemistry of the CAS, 2016, p. 86. ISBN 978-80-7080-969-3. Dostupné na internete: <www.ssc-conference.com>

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

Zodpovedný riešiteľ: Štefan Chmela
Trvanie projektu: 1.7.2016 / 30.6.2020
Evidenčné číslo projektu: APVV-15-0528
Organizácia je koordinátorom projektu: áno
Koordinátor: Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: APVV 20 000.00 € pre ÚPo (celkove 28 500.00 €)

Dosiahnuté výsledky:

Úvoné aktivity predstavovali overenie prípravy polylaktidu v tavenine v banke ako aj možnosti takejto reakcie priamo v komore Plastografu Brabender pre prípravu master-batchov. V uvedenom prípade sa ako časť iniciačného systému použijú biopolyméry, ktoré zvýšia biodegradáciu konečného produktu. Previedli sa základné merania vlastností (termická stabilita, rozpustnosť, molekulová hmotnosť) vybraných derivátov (keratín, kolagén, celulóza), ktoré budú použité ako súčasť iniciačného systému.

Výstupy:

1. JANIGOVÁ, Ivica - RYCHLÝ, Jozef - CSOMOROVÁ, Katarína - MALÍKOVÁ, Marta - HUDÁKOVÁ, Martina - RYCHLÁ, Lýdia. The effect of alkyl groups on degradation of cellulose ethers. In BIMac 2016 : XXII. Bratislava Conference on Macromolecules : Polymers with Tailored Architecture and Properties : programme book and book of abstracts. - Bratislava : Ústav polymérov SAV, 2016, p. 46. ISBN 978-80-89841-01-1. (CL-21)

2. ŠIŠKOVÁ, Alena - RYCHTER, P. - OPÁLEK, A. - PORZIO, W. - KLEINOVÁ, Angela - JANIGOVÁ, Ivica - ECKSTEIN ANDICSOVÁ, Anita. Cellulose-based controlled-release agrochemicals formulation. In Cellulosic Materials - Processing, Properties and Promising Applications: abstract book. - Budapest, Hungary : Budapest University of Technology and Economics, 2016, p. 49-50.

25.) Gumárenské zmesi s novými netradičnými plnivami pre špeciálne aplikácie. *(Rubber compounds with new types of fillers for special applications.)*

Zodpovedný riešiteľ:	Ivan Chodák
Trvanie projektu:	1.10.2013 / 30.9.2016
Evidenčné číslo projektu:	APVV-0694-12
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Fakulta chemickej a potravinárskej technológie STU, Bratislava
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 12200 €

Dosiahnuté výsledky:

V poslednom roku riešenia projektu sa pozornosť venovala ukočeniu prác tak, aby sa mohli sformulovať závery pre možné využitie v budúcnosti.

V časti práce venovanej využitiu plastifikovaného škrobu ako aktívnej prísady do kaučukov sa urobili relatívne podrobné experimenty, ktoré viedli k získaniu komplexných informácií pre cielený výber receptúry a postupu plastifikácie škrobu. Pozormosť sa zamerala na stanovenie fyzikálnych, najmä mechanických vlastností plastifikovaného škrobu s predpokladom, že cielenou zmenou vlastností škrobu bude možné ovplyvniť aj parametre celej gumárenskej zmesi.

S cieľom získať vhodný modifikátor, ktorý by mohol zvýšiť interakcie medzi kaučukovou matricou a magnetickým plnivom, sa syntetizoval kaučuk s naočkovanými karboxylovými skupinami pričom sa použili dva zdroje karboxylových skupín, a to kyselina akrylová a kyselina krotónová s výrazne rozličnými mechanizmami očkovania a štruktúry konečných produktov.

Vulkanizáty s obsahom magnetického plniva sa charakterizovali aj metódou dielektrickej spektroskopie. Táto metóda síce neposkytuje presné hodnoty všetkých sledovaných parametrov, ale umožňuje získať orientačné údaje o kvalite pripravených materiálov, pričom jej hlavnou výhodou je rýchlosť a nenáročnosť postupu. Po preverení postupov bolo možné podstatne zvýšiť efektivitu meraní a tým prispieť k presnejšej optimalizácii vlastností konečných magnetických materiálov.

Výstupy:

1. CHODÁK, Ivan - IVANIČ, František - OLČÁK, D. - JOCHEC MOŠKOVÁ, Daniela. Optimalization of structure - physical properties relation of plasticized starch. In Bio-Based Polymers and Composites : abstract book. - Budapest, Hungary : Budapest University of Technology and Economics, 2016, p. 18-19.

26.) 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:	1.7.2015 / 30.6.2019
Evidenčné číslo projektu:	APVV-14-0566
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV 25 340.00 € pre ÚPo (celkove 63 652.00 €)

Dosiahnuté výsledky:

Podrobne sa charakterizovali ďalšie vstupné suroviny, ako aj referenčný zahraničný výrobok, ktorého vlastnosti sa javia ako optimálne pre zamýšľanú aplikáciu.

Najväčšia kapacita sa venovala prácam na očkovaní polárnych skupín na základné metalocénové polyméry. V tejto fáze sa pracovalo predovšetkým s kyselinou akrylovou, ktorá sa očkovala v rôznych koncentráciách a s rôznymi dĺžkami naočkovaných reťazcov. Ďalšie pokusy sa urobili s kyselinou krotónovou, ktorá na rozdiel od kyseliny akrylovej po naočkovaní prvej molekuly monoméru ďalej nepolymerizuje, a teda vytvorené vetvy sú najkratšie ako je možné.
Tretím monomérom, ktorý sa javí ako nádejný, je akrylamid, s ktorým sa pripravili zatiaľ len dve modifikácie.
U spolupracujúcej inštitúcie sa vybrané naočkované polyolefíny použili na prípravu tavných lepidiel, ktoré sa v súčasnosti podrobne charakterizujú.
Súčasne sa preverujú aj možnosti využitia termoplastického škrobu pre úpravu jednak lepivosti a jednak spracovateľských ako aj úžitkových vlastností adhezíva (viskozita a pevnosť). Tieto práce budú pokračovať intenzívnejšie v ďalšom období.

Výstupy:

1. IVANIČ, František - CHODÁK, Ivan. Effect of composition and preparation conditions on mechanical properties of thermoplastic starch. In Modern Polymeric Materials for Environmental Applications : 6th International Seminar including COST MP1206 Workshop : Kroków, 27-29 April 2016. - Cracow, Poland : Department of Chemistry and Technology of Polymers, Crocow University of Technology, 2016, 2016, vol. 6, p. 111-116. ISBN 978-83-937270-4-9.

2. IVANIČ, František - CHODÁK, Ivan. Effect of composition on mechanical properties of thermoplastic starch. In Bio-Based Polymers and Composites : abstract book. - Budapest, Hungary : Budapest University of Technology and Economics, 2016, p. 287-288.

27.) 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:	1.7.2015 / 30.6.2019
Evidenčné číslo projektu:	APVV-14-0891
Organizácia je koordinátorom projektu:	nie
Koordinátor:	
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 22565 €

Dosiahnuté výsledky:

Za účelom zväčšenia medzičasticovej vzdialenosti oxidov železa, tzv. obálky sa pripravila séria polymérnych surfaktantov na báze n-butylakrylátu a styrénu. Kontrola dĺžky polymérneho reťazca sa dosiahla použitím ATRP polymerizačnej techniky. Pripravené polymérne surfaktanty majú úzku distribúciu mólových hmotností a ich dĺžka sa pohybuje v závislosti od polymerizačných podmienok od 1100 do 7800 g/mol. Ako funkčnú skupinu schopnú viazať sa na povrch nanočastíc sme využili dopamín, resp. fosfát. Pri viazaní polymérnych surfaktantov na povrch nanočastíc sa prešetrili dva postupy: polymerizácia z povrchu nanočastíc "grafting from" a taktiež naviazanie polyméru na povrch "grafting onto". Pôvodná veľkosť nanočastíc na úrovni 8 nm narástla po modifikácii polymérnou obálkou na 12 a 28 nm.

Výstupy:

1. ILČÍKOVÁ, Markéta - DANKO, Martin - DOROSHENKO, M. - BEST, A. - MRLÍK, M. - CSOMOROVÁ, Katarína - ŠLOUF, M. - CHORVÁT Jr., D. – KOYNOV, K. – MOSNÁČEK, Jaroslav. Visualization of carbon nanotubes dispersion in composite by using confocal laser scanning microscopy, European Polymer Journal 79 (2016) 187–197.

28.) 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:	1.7.2015 / 30.6.2019
Evidenčné číslo projektu:	APVV-143-0753
Organizácia je koordinátorom projektu:	nie
Koordinátor:	
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 5975 €

Dosiahnuté výsledky:

V rámci projektu sa modifikovali kremíkové a zlaté povrchy sulfobetaínmi a karboxybetaínmi. Modifikácia sa uskutočnila dvomi spôsobmi: 1.) naviazaním tiolových skupín cez silány na kremíkový povrch a ich následné využitie ako iniciátorov pre polymerizáciu derivátov lipoovej kyseliny za vzniku polydisulfidov; 2.) modifikáciou zlatých povrchov derivátmi lipoovej kyseliny. V oboch prípadoch sa podarilo povrchy modifikovať, čo bolo dokázané meraním uhla zmáčania, profilometriou ako i pomocou AFM.

29.) 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:	1.7.2016 / 30.6.2020
Evidenčné číslo projektu:	APVV-15-0741
Organizácia je koordinátorom projektu:	nie
Koordinátor:	
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 9700 €

Dosiahnuté výsledky:

Vzhľadom na to, že projekt začal v lete 2016, v prvej fáze sa riešili v podstate prípravné práce pre projekt, t.j. objednávky vstupných surovín, spresnenie rešeršných údajov z literatúry a predovšetkým spresnenie postupov pre charakterizáciu výsledných materiálov. Začali sa práce na príprave modifikátorov na fáze fosfóniových katiónov pre hydrofobizáciu povrchov ílov ako prekurzorov nanočastíc. Súčasne sa urobili niektoré práce pre prípravu nanokompozitov s klasickou modifikáciou amóniovými katiónmi. Tieto výsledky budú slúžiť ako referenčné údaje pre posúdenie účinnosti a prípadných výhod nanokompozitov s novými plnivami na báze fosfóniových katiónov.

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 intercalable surfactants. Clay and Clay Minerals, odoslané

30.) 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: 6280 €

Dosiahnuté výsledky:

V prvom roku riešenia projektu sa pripravili dva typy modifikovaných dextránov obsahujúcich cholesterové skupiny, ktoré sa odlišovali mólovou hmotnosťou. Tieto deriváty sa následne použili na pokrývanie lipoproteínov pri konštrukcii transportných systémov pre protinádorovú liečbu. Taktiež sa pripravili flexibilné poly(2-metyl-2-oxazolínové) linkre obsahujúce maleimidovú a N-hydroxysukcínimidovú väzbu na spájanie peptidov cez tiol-énovú „click“ reakciu a NHS aktivovanú reakciu. Koncept spájania lipoproteínu s afinitným peptidom sa potvrdil použitím komerčného linkra na báze polyetylénglykolu.

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. Odoslané do Journal of Polymer Research, JPOL-S-16-01140.

31.) 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:	1.7.2015 / 30.6.2019
Evidenčné číslo projektu:	APVV-14-0858
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	1 - Slovensko: 1
Čerpané financie:	APVV 38 686.00 € pre ÚPo (celkove 48 598.00 €)

Dosiahnuté výsledky:

Aktivity v roku 2016, okrem nastavenia procesných parametrov a zavedenia kontinuálneho dvojkrokového enkapsulačného procesu, zahŕňali aj zavedenie nových metodík testovania mikrokapsúl (ako napr. konfokálna Ramanova mikroskopia, CRM), resp. in-house syntézu, charakterizáciu a testovanie nosných komponentov mikrokapsúl (SCS – sodná soľ sulfátu celulózy a PMCG – poly(metylén-ko-kyanoguanidín-hydrochlorid), za účelom nastavenia a detailného poznania vlastností mikrokapsúl a ich následného zhodnotenia pri výbere vhodných kandidátov na transplantáciu do zvieracích modelov (nude myši, C57/bl6 myši, makaky). Významným prínosom pri štúdiu priestorovej distribúcie polymérnych zložiek v mikrokapsulách a mikrosférach bolo využitie metodiky CRM spolu s Fyzikálnym ústavom SAV. Súčasťou aktivít projektu je syntéza a charakterizácia vodorozpustných polymérov, enkapsulácia protilátok a príprava hydrogélových častíc rôznych typov.

Výstupy:

1. TAKÁČOVÁ, M. - HLOUŠKOVÁ, Gabriela - ZAŤOVIČOVÁ, M. - BENEJ, M. - SEDLÁKOVÁ, O. - KOPÁČEK, J. - PASTOREK, J. - LACÍK, Igor - PASTOREKOVÁ, S. Encapsulation of anti-carbonic anhydrase IX antibody in hydrogel microspheres for tumor targeting. In European Journal of Pharmaceutical Sciences, 2016, vol., no., p. 1-9 EPUB. (3.773 - IF2015). ISSN 0928-0987.

2. RÁZGA, Filip - *VNUKOVÁ, Dominika* - NÉMETHOVÁ, Veronika - MAZANCOVÁ, Petra - LACÍK, Igor. Preparation of chitosan-TPP-sub-micron particles: Critical evaluation and derived recommendations. In Carbohydrate Polymers, 2016, vol. 151, p. 488-499. (4.219 - IF2015). ISSN 0144-8617.

3. KRONEKOVÁ, Zuzana - PELACH, M. - MAZANCOVÁ, Petra - UHELSKÁ, Lucia - TREĽOVÁ, Dušana - ŠIFFALOVIČ, P. - MAJKOVÁ, E. - LACÍK, Igor. Confocal raman spectroscopy: A powerful tool for microcapsules characterization. In XXIV International Conference on Bioencapsulation : Lisbon, Portugal, September 21-23, 2016. - Lisbon, Portugal : Bioencapsulation Research Group, 2016, p. 30-31.

4. TREĽOVÁ, Dušana - UHELSKÁ, Lucia - RÁZGA, Filip - NÉMETHOVÁ, Veronika - MAZANCOVÁ, Petra - KRONEKOVÁ, Zuzana - *MIHÁLOVÁ, Andrea* - ROKSTAD, A.M. - MARCHESE, E. - MCGARRIGLE, J. - OMAMI, M. - OBERHOLZER, J. - LACÍK, Igor. SA-CS-PMCG microcapsule concept: Preparation, characterization, performance. In XXIV International Conference on Bioencapsulation : Lisbon, Portugal, September 21-23, 2016. - Lisbon, Portugal : Bioencapsulation Research Group, 2016, p. 104-105.

32.) 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:	1.7.2016 / 30.6.2020
Evidenčné číslo projektu:	APVV-15-0545
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV 27 455.00 € pre ÚPo (celkove 30 255.00 €)

Dosiahnuté výsledky:

Optimalizovali sa podmienky fotoATRP v prítomnosti limitovaného množstva vzduchu pre metyl metakrylát ako i pre metyl akrylát v DMSO ako rozpúšťadle. Uskutočnili sa i hlbšie štúdia mechanizmu, ktorým dochádza k spotrebe kyslíka pred tým ako sa iniciuje samotná polymerizácia. Preštudoval sa vplyv koncentrácie ligandu a intenzity svetla ako aj koncentrácie kyslíka v systéme na veľkosť indukčnej periódy a kinetiku polymerizácie. Ukázalo sa, že dôležitú úlohu pri spotrebe kyslíka v systéme hrá ligand, ktorého nadbytok môže výrazne skrátiť indukčnú periódu a následne i zvýšiť rýchlosť 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, čím spotrebováva kyslík a zkracuje indukčnú periódu, a jednak, po spotrebovaní kyslíka ligand týmto spôsobom napomáha redukcii komplexu medi vo vyššom oxidačnom stave a tým zvyšuje rýchlosť polymerizácie.

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

Zodpovedný riešiteľ:	Mária Omastová
Trvanie projektu:	1.7.2015 / 30.6.2019
Evidenčné číslo projektu:	APVV-14-0120
Organizácia je koordinátorom projektu:	áno

Koordinátor: Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: APVV 22 228.00 € pre ÚPo (celkove 62 700.00 €)

Dosiahnuté výsledky:

Bolo použitých niekoľko spôsobv modifikácie grafénových nanoplatforiem. Skúmal sa vplyv činidiel na vznik amidických reakcií potrebných pri modifikáciach v prípadoch rozdielnych podmienok. Jednotlivé charakteristiky sa vykonávali u projektových partnerov na Fyzikálnom a Virologickom ústave. Na Fyzikálnom ústave sa vykonali AFM merania a Ramanova spektroskopia, zatiaľ čo na Virologickom ústave boli vzorky podrobené testom viability, ELISA testom a imunofluorescencií, s využitím konfokálneho mikroskopu. Superparamagnetické nanočastice (MNPs) s priemerom 10 nm boli pripravené vo vodnom roztoku a pokryté lizínom, na tieto sa naviazali monoklonálne protilátky (MAb), získané z média hybridómových buniek sú proteíny. Takto modifikované MNPs sa použili na naviazenie priamo na grafénovú nanoplatformu. V ďalšom kroku sa charakterizovali rôznymi technikami.

Výstupy:

1. BUGÁROVÁ, Nikola - ŠPITÁLSKY, Zdenko - ŠIFFALOVIČ, P. - BODIK, M. - KONERACKÁ, M. - ZAŤOVIČOVÁ, M. - OMASTOVÁ, Mária. Biosenzory na báze modifikovaného grafén oxidu. In Czech Chemical Society Symposium Series, 2016, roč.14, č. 5, s. 233. ISSN 2336-7202. Dostupné na internete: <www.ccsss.cz>.

2. BUGÁROVÁ, Nikola - MIČUŠÍK, Matej - ŠPITÁLSKY, Zdenko - ŠIFFALOVIČ, P. - OMASTOVÁ, Mária. Organic/inorganic nanoplatform for detection of cancer. In ANNIC 2016 : Applied nanotechnology and nanoscience international conference : book of abstracts. - Barcelona, Spain : University Pompeu Fabra, 2016, p. 202. Dostupné na internete: .

3. FORRÓ, Klaudia - BUGÁROVÁ, Nikola - ŠPITÁLSKY, Zdenko - ŠIFFALOVIČ, P. - KONERACKÁ, M. - ZAŤOVIČOVÁ, M. - PASTOREKOVÁ, S. - OMASTOVÁ, Mária. Development of graphene-based sensors in biomedical application. In ICSM 2016 : the 24th International Conference on Science and Technology of Synthetic Metals. - Guangzhou, China : South China University of Technology, 2016, abstract no. W-1-7.

4. SOHOVÁ, M. - BODÍK, M. - ŠIFFALOVIČ, P. - JERGEL, M. - HIANIK, T. - BUGÁROVÁ, Nikola - ŠPITÁLSKY, Zdenko - OMASTOVÁ, Mária - LABUDOVÁ, M. - PASTOREKOVÁ, S. - MAJKOVÁ, E. Confocal Raman spectroscopy study of intracellular localization of graphene oxide nanoplatform under development for targered delivery to cancer cells. In graphene 2016 : abstracts book. - Genoa, Italy : Phantoms foundation, 2016, abstract no. 109. Dostupné na internete: <www.grapheneconf.com>.

34.) 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: 1.7.2015 / 30.6.2019
Evidenčné číslo projektu: APVV-14-0932
Organizácia je koordinátorom projektu: nie
Koordinátor:
Počet spoluriešiteľských inštitúcií: 0
Čerpané financie: APVV: 9810 €

Dosiahnuté výsledky:

V rámci projektu sme sa zamerali na prípravu nanočastíc so zapuzdrením kurkumínu a

simvastatínu. Najprv sme použili pri príprave polymérneho obalu kopolymér N-isopropylakrylamidu (NIPAAM), N-vinyl-2-pyrolidónu (VP) a poly(etylénglykol)-monometakrylátu (PEG360) alebo poly(etylénglykol) monoakrylátu (PEG2000). Získané nanočastice však boli nestabilné a pri opakovaní experimentu sa zistilo, že aj nereprodukovateľné. Z tohto dôvodu sme sa venovali optimalizácii zloženia kopolyméru. Zosieťované micelárne agregáty boli získané voľno radikálovou polymerizáciu zosyntetizovaných analógov NIPPAM-u (metylakrylamidové deriváty), VP a PEG360. Po optimalizácii zloženia a postupu prípravy nanočastíc s reprodukovateľnou veľkosťou a distribúciou bude následne kopolymér použitý na enkapsuláciu kurkumínu a simvastatínu. Predmetom ďalšieho štúdia bude stabilita pripravených nanočastíc v kyslom prostredí a rýchlosť uvoľňovania simvastatínu in vitro a in vivo.

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

Zodpovedný riešiteľ:	Michal Procházka
Trvanie projektu:	1.7.2016 / 30.6.2020
Evidenčné číslo projektu:	APVV-15-0201
Organizácia je koordinátorom projektu:	nie
Koordinátor:	Medzinárodné laserové centrum, Bratislava
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 1500 €

Dosiahnuté výsledky:

Projekt začal v júli 2016 a počiatočná fáza je zameraná hlavne na chemickú analýzu a charakterizáciu základných komponentov tvoriacich fenolformaldehydové živice a drevoplastové kompozity s využitím lignínu. Doposiaľ boli pomocou SIMS analyzované rôzne druhy lignínu (lignín z UPM, lignín zo slamy z Talianska, ...). Pri týchto meraniach boli sledované rozdiely v zložení jednotlivých typoch lignínov. Priemyselný partner projektu vytvoril a vybral dva typy nových fenolformaldehydových živíc (Fenokol 24TL a Fenokol 25TL), ktoré by mali byť následne použité na testovanie mechanických vlastností. Tieto testy začnú na našom pracovisku začiatkom roka 2017.

36.) 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 24 526.00 € pre ÚPo (celkove 32 800.00 €)

Dosiahnuté výsledky:

i) Predložený návrh sekvencie oligonukleotidov pre ich následnú chemickú syntézu na základe in silico analýz

ii) Vybrané varianty telechelického polymérneho komponentu rôznej chemickej štruktúry plánovaného na konjugáciu s oligonukleotidmi

iii) Dizajn a príprava liekového nosiča na báze chitozánu (pracuje sa na jeho stabilizácii pre využitie vo fyziologických podmienkach)

iv) Charakterizácia a in vitro testovanie liekových nosičov na báze magnetitu

Výstupy:

1. NÉMETHOVÁ, Veronika – RÁZGA, Filip. Overexpression of ABCB1 as predicition marker for CML: How close we are to translation into clinics? Leukemia. 2017; vol. 31, p. 266-267

2. RÁZGA, Filip – NÉMETHOVÁ, Veronika. Gene expression patterns as predictive biomarkers in hemato-oncology: Principal hurdles on the road to the clinic. Haematologica. 2016; vol. 102, p. e31-32

3. MAZANCOVÁ, Petra – NÉMETHOVÁ, Veronika – LACÍK, Igor – RÁZGA, Filip. Chitosan-based particles: The (forgotten) interplay between process, properties and performance. Mater Sci Eng C Mater Biol Appl. 2016; vol. 71, p. 570-571

4. RÁZGA, Filip – NÉMETHOVÁ, Veronika. A method for altering the functional state of any mRNA allowing its selective and specific recognition. PCT/SK2016/060002

5. RÁZGA, Filip – NÉMETHOVÁ, Veronika. Prognostic value of ABCB1 overexpression in predicting outcome of CML patients: Where are we after a decade? XVIII. Slovensko-Český hematologický a transfuziologický zjazd. 20-22 October 2016, Bratislava, Slovak Republic, Interná medicína. 2016; S7, p. 25

6. RÁZGA, Filip – NÉMETHOVÁ, Veronika – MAZANCOVÁ, Petra – BULIAKOVÁ, B. – BÁBELOVÁ, A. – ŠELC, M. – GÁBELOVÁ, A. Magnetite nanoparticles in biomedicine: Critical role of particle characterization in interpretation of biological data. XXV. Biochemicky sjezd. 13-16 September 2016, Prague, Czech Republic, Book of Abstracts, p. 85

7. BULIAKOVÁ, B. – ŠELC, M – BÁBELOVÁ, A – NÉMETHOVÁ, Veronika – RÁZGA, Filip – GÁBELOVÁ, A. Genotoxicity of surface-modified magnetite nanoparticles raises concerns about their biosafety. XXV. Biochemicky sjezd. 13-16 September 2016, Prague, Czech Republic, Book of Abstracts, p. 225

8. MAZANCOVÁ, Petra – NÉMETHOVÁ, Veronika – RÁZGA, Filip – LACÍK, Igor. Controlled preparation and stabilization of chitosan/TPP sub-micron particles. XXIV International Conference on Bioencapsulation. 21-23 September 2016, Lisbon, Portugal, Book of Abstracts, p. 142-143

37.) 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:	1.7.2016 / 30.6.2020
Evidenčné číslo projektu:	APVV-15-0296
Organizácia je koordinátorom projektu:	nie
Koordinátor:	
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 4000 €

Dosiahnuté výsledky:

V prvom roku riešenia projektu sme sa v súlade s plánovanými cieľmi zamerali na stanovenie fyzikálno-chemických vlastností (veľkosť, distribúcia, stabilita, zeta potenciál) nanočastíc striebra a oxidu titaničitého pripravené v rôznych experimentálnych podmienkach (kultivačné média, fyziologický roztok, pH, teplota) pomocou metód TEM a DLS. V in vitro podmienkach sme sledovali koncentračný a časový priebeh pôsobenia testovaných nanočastíc striebra a oxidu titaničitého na proliferáciu a apoptózu vybraných ľudských bunkových línií (MCF7, ACHN, MDA) a na funkčný stav ovariálnych granulóznych buniek (produkcia steroidných hormónov) v rôznych experimentálnych podmienkach.

38.) 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:	1.7.2016 / 30.6.2020
Evidenčné číslo projektu:	APVV-15-0641
Organizácia je koordinátorom projektu:	nie
Koordinátor:	
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV: 4500 €

Dosiahnuté výsledky:

Na Fyzikálnom ústave sa pripravili modelové modifikácie na Si wafroch, kde sme pomocou XPS metódy identifikovali naviazanie NH2 skupín a následne aj vznik NC=O amidovej skupiny. Týmito modelovými modifikáciami chceme overiť ako sa nám na tieto funkčné skupiny bude viazať daná protilátka. Pripravili sme aj tzv. zwitterióny, konkrétne sulfobetain a carboxybetain, ktoré obsahujú na jednom konci lipoovú kyselinu schopnú naviazať sa na MoS2. Tieto látky by sa dali následne použiť ako primárny biokompatibilný agent miesto komerčne používaného PEGovaného derivátu (lipoic-PEG-NH2). Spomínaný lipoic-PEG-NH2 by sa potom použil pri fukcionalizácii napr. v pomere 10% ku zwitteriónu. Keďže čisto PEG-pokrytie povrchu zvyšuje viskozitu prostredia a naviazaný proteín nie je dostatočne voľný, očakávame, že zníženie obsahu PEG a samotná prítomnosť zwitteriónu zlepší naviazanie proteínu/protilátky.

Výstupy:

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39.) 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:	1.7.2015 / 30.6.2019
Evidenčné číslo projektu:	APVV-14-0518
Organizácia je koordinátorom projektu:	áno
Koordinátor:	Ústav polymérov SAV
Počet spoluriešiteľských inštitúcií:	0
Čerpané financie:	APVV 45 000.00 € pre ÚPo (celkove 90 000.00 €)

Dosiahnuté výsledky:

Použitím nízkoteplotnej plazmy sme sledovali generovanie a stabilitu vzniknutých radikálov na povrchoch PES a PP textílií. Vzniknuté radikály majú výrazný vplyv na následnú permanentnú povrchovú úpravu textílie. U oboch typoch textílií sa pozoroval nárast počtu radikálov s rastúcim časom pôsobenia plazmy (0 – 150 sec), pričom radikály exponenciálne zanikajú s časom. Tento zánik je v prípade PES textílie rýchlejší ako v prípade PP textílie. Pre najdlhšie časy aktivácie

textílie sa dosiahla zároveň maximálna permanentnosť úpravy.

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Príloha C

Publikačná činnosť organizácie (*generovaná z ARL*)

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4. [1.1] LARSEN, B.E. - BJORNSTAD, J. - PETTERSEN, E.O. - TONNESEN, H.H. - MELVIK, J.E. Rheological characterization of an injectable alginate gel system. In BMC BIOTECHNOLOGY. ISSN 1472-6750, MAY 6 2015, vol. 15., WOS
5. [1.1] LIU, Y.G. - CHEN, Z.X. - WANG, S.B. - LONG, R.M. - FAN, J.Q. - CHEN, A.Z. - WU, W.G. Preparation of ALG-g-Lys and its application as a novel drug carrier. In JOURNAL OF MATERIALS CHEMISTRY B. ISSN 2050-750X, 2015, vol. 3, no. 17, p. 3420-3424., WOS
6. [1.1] MAHOU, R. - BORCARD, F. - CRIVELLI, V. - MONTANARI, E. - PASSEMARD, S. - NOVERRAZ, F. - GERBER-LEMAIRE, S. - BUEHLER, L. - WANDREY, C. Tuning the Properties of Hydrogel Microspheres by Adding Chemical Cross-linking Functionality to Sodium Alginate. In CHEMISTRY OF MATERIALS. ISSN 0897-4756, JUN 23 2015, vol. 27, no. 12, p. 4380-4389., WOS
7. [1.1] MEIER, R.P.H. - NAVARRO-ALVAREZ, N. - MOREL, P. - SCHUURMAN, H.J. - STROM, S. - BUHLER, L.H. Current status of hepatocyte xenotransplantation. In INTERNATIONAL JOURNAL OF SURGERY. ISSN 1743-9191, NOV 2015, vol. 23, B, SI, p. 273-279., WOS
8. [1.1] MOHAJERI, S. - BURKE, N.A.D. - STOVER, H.D.H. The stability of enamine crosslinks

formed from acetoacetate/amine in synthetic hydrogels. In POLYMER DEGRADATION AND STABILITY. ISSN 0141-3910, APR 2015, vol. 114, p. 94-104., WOS

ADEB Vedecké práce v ostatných zahraničných časopisoch – neimpaktovaných

ADEB01 BORSIG, Eberhard - UJHELYOVÁ, Anna - MLYNARČÍKOVÁ, Zita - KAEMFER, Dirk - MÜLHAUPT, Rolf - MARCINČIN, Anton - BEREK, Dušan. DSC study of syndiotactic polypropylene-organoclay nanocomposite fibers: crystallization and melting behavior. In International Journal of Polymeric Materials, 2007, vol. 56, p. 771-788. ISSN 0091-4037.

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1. [1.1] IDUMAH, C.I. - HASSAN, A. - AFFAM, A.C. A review of recent developments in flammability of polymer nanocomposites. In REVIEWS IN CHEMICAL ENGINEERING. ISSN 0167-8299, APR 2015, vol. 31, no. 2, p. 149-177., WOS

ADEB02 CAPEK, Ignác. On the inverse miniemulsion copolymerization and terpolymerization of acrylamide, N,N-methylene bis(acrylamide) and methacrylic acid. In Central European Journal of Chemistry, 2003, vol. 3, p. 291-304. ISSN 1895-1066.

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ADEB03 CAPEK, Ignác. On the hybride inverse-emulsion polymerization of acrylamide. In Polymer - Plastics Technology & Engineering, 2005, vol. 44, no. 4, p. 539 - 555. ISSN 0360-2559.

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1. [1.1] HAJIGHASEM, A. - KABIRI, K. Novel crosslinking method for preparation of acrylic thickener microgels through inverse emulsion polymerization. In IRANIAN POLYMER JOURNAL. ISSN 1026-1265, DEC 2015, vol. 24, no. 12, p. 1049-1056., WOS

ADEB04 JANIGOVÁ, Ivica - LEDNICKÝ, František - JOCHEC MOŠKOVÁ, Daniela - CHODÁK, Ivan. Nanocomposites with biodegradable polycaprolactone matrix. In Macromolecular Symposia, 2011, vol. 301, p. 1-8. ISSN 1022-1360.

Citácie:

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ADEB05 NOVÁK, Igor - FLORIÁN, Štepán. Investigation of hydrophilicity of polyethylene modofied by electric discharge in the course of aging. In Journal of Materials Science Letters, 2001, vol. 20, p. 1289-1291. (0.496 - IF2000). ISSN 0261-8028.

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1. [1.2] JELIL, R.A. A review of low-temperature plasma treatment of textile materials. (2015) Journal of Materials Science, 50 (18), p. 5913-5943. DOI: 10.1007/s10853-015-9152-4, Scopus

ADEB07 TAVMAN, Ismail - CECEN, Volkan - OZDEMIR, I. - TURGUT, Alparslan - KRUPA, Igor - OMASTOVÁ, Mária - NOVÁK, Igor. Preparation and characterization of highly electrically and thermally conductive polymeric nanocomposites. In Archives of Materials Science, 2008, vol. 29, no. 1 - 2, p. 77 - 83. ISSN 1734-9885.

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2. [1.2] NASIR, A.- KAUSAR, A. - YOUNUS, A. Polymer/Graphite Nanocomposites: Physical Features, Fabrication and Current Relevance. (2015) Polymer - Plastics Technology and Engineering, 54 (7), p. 750-770. DOI: 10.1080/03602559.2014.979503, Scopus

ADMB Vedecké práce v zahraničných neimpaktovaných časopisoch registrovaných v databázach Web of Science alebo SCOPUS

ADMB01 LACÍK, Igor. Current status on immunoprotection of transplanted islets: Focus on islet microencapsulation. In Micro and Nanosystems, 2013, vol. 5, no. 3, p. 168 - 176. (2013 - SCOPUS). ISSN 1876-4029.

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1. [1.2] MAHOU, R.- BORCARD, F.- CRIVELLI, V.- MONTANARI, E.- PASSEMARD, S.- NOVERRAZ, F.- GERBER-LEMAIRE, S.- BÜHLER, L.- WANDREY, C. Tuning the Properties of Hydrogel Microspheres by Adding Chemical Cross-linking Functionality to Sodium Alginate. (2015) Chemistry of Materials, 27 (12), p. 4380-4389. DOI: 10.1021/acs.chemmater.5b01098, Scopus

ADMB02 PEOGLOS, V. - LOGAKIS, E. - PANDIS, Ch. - PISSIS, P. - PIONTECK, J. - POTSCHKE, P. - MIČUŠÍK, Matej - OMASTOVÁ, Mária. Thermal and electrical characterization of multi-walled carbon nanotubes reinforced polyamide 6 nanocomposites. In Journal of Nanostructured Polymers and Nanocomposites, 2007, vol. 3, no.4, p. 116-124. ISSN 1790-4439.

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1. [1.2] BESCO, S.- LORENZETTI, A.- HRELJA, D.- BOARETTI, C.- ROSO, M.- FERRI, D.- MODESTI, M. Influence of melt viscosity on the structure and properties of electrically conductive nanocomposites produced by masterbatch process. (2014) Macromolecular Materials and Engineering, 299 (7), p. 814-824. DOI: 10.1002/mame.201300336, Scopus
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ADMB03 RAČKO, Dušan. On the relatioship of the relative intensity I3 and a cavity number as obtained from computer simulations. In Materials Science Forum, 2013, vol. 733, p. 183-189. (2013 - WOS, SCOPUS). ISSN 0255-5476.

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1. [1.1] CHANTAWANSRI, T.L. - YEH, I.C. - HSIEH, A.J. Investigating the glass transition temperature at the atom-level in select model polyamides: A molecular dynamics study. In POLYMER. ISSN 0032-3861, DEC 16 2015, vol. 81, p. 50-61., WOS

ADNA Vedecké práce v domácich impaktovaných časopisoch registrovaných v databázach Web of Science alebo SCOPUS

ADNA01 HURAN, Jozef - VALOVIČ, Albín - KUČERA, Michal - KLEINOVÁ, Angela - KOVÁČOVÁ, Eva - BOHÁČEK, Pavol - SEKÁČOVÁ, Mária. Hydrogenated amorphous silicon carbon nitride films prepared by PECVD technology: properties. In Journal of Electrical Engineering, 2012, vol. 65, p. 333-335. (0.370 - IF2011). (2012 - INSPEC, SCOPUS). ISSN 1335-3632.

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3. [1.1] HAACKE, M. - COUSTEL, R. - ROUESSAC, V. - DROBEK, M. - ROUALDES, S. - JULBE, A. In EUROPEAN PHYSICAL JOURNAL-SPECIAL TOPICS. JUL 2015, vol. 224, no. 9, p. 1935-1943., WOS

AECA Vedecké práce v zahraničných recenzovaných zborníkoch a kratšie kapitoly/state v zahraničných vedeckých monografiách alebo VŠ učebniciach

AECA01 CAMPO, E. M. - ROIG, J. - ROEDER, B. - WENN, D. - MAMOJKA, B. - OMASTOVÁ, Mária - TERENTJEV, E. M. - ESTEVE, J. Nano opto-mechanical systems NOMS as a proposal for tactile displays. In Nano-Opto-Mechanical Systems (NOMS) : Proceedings of SPIE. - Bellingham, USA : SPIE - Int. Soc. Opt. Engineering, 2011, vol. 8107, art.n. 8107OH - p.1-10. ISBN 978-0-81948-717-9. ISSN 0277-786X.

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1. [1.1] WHITE, T.J. - BROER, D.J. Programmable and adaptive mechanics with liquid crystal polymer networks and elastomers. In NATURE MATERIALS. ISSN 1476-1122, NOV 2015, vol. 14, no. 11, p. 1087-1098., WOS

AECA02 MATISOVÁ - RYCHLÁ, Lýdia - RYCHLÝ, Jozef. Inherent relations of chemiluminescence and thermooxidation of polymers. In Advances in Chemistry Series : Polymer Durability, Degradation, Stabilization, and Liftime Prediction,

1996, vol. 249, p. 175 - 193. ISBN 0-8412-3134-6. ISSN 0065-2393.
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1. [1.1] FRANCOIS-HEUDE, A. - RICHAUD, E. - GUINAULT, A. - DESNOUX, E. - COLIN, X. Impact of Oxygen Transport Properties on Polypropylene Thermal Oxidation, Part 1: Effect of Oxygen Solubility. In JOURNAL OF APPLIED POLYMER SCIENCE. ISSN 0021-8995, FEB 5 2015, vol. 132, no. 5., WOS

AFC Publikované príspevky na zahraničných vedeckých konferenciách

AFC01 ISKROVÁ, Martina - MAJERNÍK, Viktor - ILLEKOVÁ, Emília - ŠAUŠA, Ondrej - BEREK, Dušan - KRIŠTIAK, Jozef. Free volume seen by positronium in bulk and confined molecular liquid. In Materials Science Forum. Vol. 607: Positron and Positronium Chemistry. 9th International Workshop, May 11-15, 2008, China. - Zurich : Trans Tech Publications LTD, 2009, p. 235-237. ISSN 0255-5476.
Citácie:
1. [1.1] ZALESKI, Radoslaw. Principles of positron porosimetry. In NUKLEONIKA. ISSN 0029-5922, 2015, vol. 60, no. 4, pp. 795., WOS

***AFHA Abstrakty príspevkov z medzinárodných vedeckých konferencií poriadaných v SR**

AFHA01 BAŇASOVÁ, Mária - VALACHOVÁ, Katarína - RYCHLÝ, Jozef - PRIESOLOVÁ, Elena - NAGY, Milan - JURÁNEK, Ivo - ŠOLTÉS, Ladislav. Scavening and chain-breaking activity of bucillamine on free-radical-mediated degradation of high-molar-mass hyaluronan. In ChemZi : slovenský časopis o chémii pre chemické vzdelávanie, výskum a priemysel, 2011, roč. 7, č.13, s. 205-206. ISSN 1336-7242.(VEGA č. 2/0083/09 : Energetický metabolismus mozgu sledovaný pomocou magnetickej rezonancie ako podklad pre štúdium mechanizmov hypoxicko-ischemického poškodenia mozgu novorodenca. VEGA č. 2/0011/11 : Štúdium pôsobenia reaktívnych foriem kyslíka a dusíka na vysokomolekulový hyalurónan, synoviocyty a chondrocyty. VEGA č. 2/0081/11 : Štúdium mechanizmov a možností skorej detekcie embryofetálneho poškodenia v dôsledku intrautreinnej a perinatálnej hypoxie. Zjazd chemikov : IYC 2011. International Year of Chemistry. Medzinárodný rok chémie).
Citácie:
1. [3.1] OMER, A.M. - TAMER, M. T. - MOHYELDIN, M.S. High-molecular weight biopolymer. (Book chapter 2). In Gennady E. Zaikov edit. Analysis and Performance of Engineering Materials: Key Research and Development. Toronto, New Jersey: Apple Academic Press, 2015, p. 19-43. ISBN 978-1-77188-085-5.

BBA Kapitoly v odborných knižných publikáciách vydané v zahraničných vydavateľstvách

BBA01 KRUPA, Igor - PROKEŠ, Jan - KŘIVKA, Ivo - ŠPITÁLSKY, Zdenko. Electrically conductive polymeric composites and nanocomposites. In Handbook of Multiphase Polymer Systems. - Chichester, UK : John Wiley and Sons Ltd., 2011, vol. 1, Chapter 11, p. 425 -477. ISBN 978-0-470-71420-1.
Citácie:
1. [1.2] MALINOVSKAYA, T.- MELENTYEV, S.- PAVLOV, S. Multifunctional composite material based on carbon-filled polyurethane. (2015) IOP Conference Series: Materials Science and Engineering, 93 (1), art. no. 012038, DOI: 10.1088/1757-899X/93/1/012038, Scopus
2. [1.2] POTEKAEV, A.I.-MALINOVSKAYA, T.D.- MELENTYEV, S.V.-

PAVLOV, S.V. Investigation of thermostability of resistive coatings based on carbon-filled polyurethane. (2015) AIP Conference Proceedings, 1683, art. no. 020188, DOI: 10.1063/1.4932878, Scopus

Príloha D

Údaje o pedagogickej činnosti organizácie

Semestrálne prednášky:

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

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

Semestrálne cvičenia:

Mgr. Zuzana Benková, PhD.
Názov semestr. predmetu: seminár a cvičenia z molekulovej dynamiky pre študentov 4 ročníka
Počet hodín za semester: 3
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedre fyzikálnej a teoretickej chémie

Semináre:

Mgr. Zuzana Benková, PhD.
Názov semestr. predmetu: seminár pre študentov 4 ročníka
Počet hodín za semester: 2
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedre fyzikálnej a teoretickej chémie

Terénne cvičenia:

Mgr. Juraj Kronek, PhD.
Názov semestr. predmetu: Príprava polymérov obsahujúcich násobnú väzbu a ich využitie pre „click“ reakcie
Počet hodín za semester: 100
Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, vedenie bakalárskej práce študentky Z. Rafaelisovej

Ing. Igor Lacík, DrSc.
Názov semestr. predmetu: Rýchlostná konštanta propagácie pre radikálovú polymerizáciu monomérov rozpustných vo vode
Počet hodín za semester: 80
Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, vedenie diplomovej práce študentky P. Bošeľovej

Ing. Daniela Moravčíková, PhD.
Názov semestr. predmetu: Syntéza a purifikácia morfolínových nukleozidov
Počet hodín za semester: 150
Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, vedenie študentky (Kristína Dicová) – VPS

Ing. Daniela Moravčíková, PhD.
Názov semestr. predmetu: Syntéza nových typov katalyzátorov pre fotochemicky riadenú radikálovú polymerizáciu
Počet hodín za semester: 360
Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, vedenie bakalárskej práce B. Némethovej

Mgr. Jaroslav Mosnáček, DrSc.
Názov semestr. predmetu: vedenie študenta (Paulína Macugowska) zo zahraničia v rámci programu ERASMUS (1.8. – 30.9.2016)
Počet hodín za semester: 200
Názov katedry a vysokej školy: Politechnika Lodzska, Poľsko, program ERASMUS

Ing. Filip Rázga, PhD.
Názov semestr. predmetu: Vplyv tubulárnych nanoplnív na vlastnosti hydrogélov na báze biodegradovateľných polymérov- FCHPT-13569-64581
Počet hodín za semester: 60
Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, konzultant bakalárskej práce Bc. Lucie Benovičovej

Mgr. Zdenko Špitálsky, PhD.
Názov semestr. predmetu: vedenie diplomovej práce
Počet hodín za semester: 60
Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, vedenie diplomovej študentky - Bc. J. Kozakovičová

Mgr. Zdenko Špitálsky, PhD.
Názov semestr. predmetu: vedenie diplomovej práce
Počet hodín za semester: 250
Názov katedry a vysokej školy: Strojnícka fakulta STU, vedenie diplomovej práce študentky- Bc. A. Fečková

Individuálne prednášky:

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

Mgr. Juraj Kronek, PhD.
Názov semestr. predmetu: Nové trendy v syntéze polymérov
Počet hodín za semester: 2
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, prednášky pre študentov 2. ročníka v rámci predmetu Nové trendy v organickej chémii

Ing. Igor Lacík, DrSc.
Názov semestr. predmetu: Mikrokpsuly pre liečbu cukrovky
Počet hodín za semester: 2
Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, prednáška pre doktorandov (1. ročník)) - odbor Makromolekulová chémia

Mgr. Jaroslav Mosnáček, DrSc.
Názov semestr. predmetu: Nové trendy v syntéze polymérov
Počet hodín za semester: 2
Názov katedry a vysokej školy: Prírodovedecká fakulta UK, Katedra organickej chémie - prednášky pre študentov 2. r.- predmet Nové trendy v organickej chémii

Mgr. Jaroslav Mosnáček, DrSc.
Názov semestr. predmetu: Organická chémia ako základ pre nové polymérne materiály
Počet hodín za semester: 2
Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, prednáška pre študentov 2. ročníka - Katedra organickej chémie FCHPT STU

Ing. Igor Novák, PhD.
Názov semestr. predmetu: „Spájanie polymérnych a kovových materiálov lepením“ a „Povrchové vlastnosti polymérnych a kovových materiálov“
Počet hodín za semester: 2
Názov katedry a vysokej školy: Materiálovotechnologická fakulta STU v Trnave, pre 4. ročník štúdia

Ing. Mária Omastová, DrSc.
Názov semestr. predmetu: Elektricky vodivé polymérne kompozity
Počet hodín za semester: 2
Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, prednáška pre doktorandov (1. ročník)) - odbor Makromolekulová chémia

Mgr. Zdenko Špitálsky, PhD.
Názov semestr. predmetu: Elektricky vodivé polymérne kompozity
Počet hodín za semester: 2
Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, prednáška pre doktorandov - odbor Makromolekulová chémia

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**
Belgicko			Matej Mičušík	8		
Česko	Ivica Janigová	8	Angela Kleinová	3	Lucia Kleščíková	1
			Juraj Kronek	2	Jaroslav Kuliček	1
			Juraj Kronek	1	Igor Lacík	1
			Igor Lacík	1	Igor Lacík	1
			Miroslava Lukešová	153	Igor Lacík	1
			Petra Mazancová	2	Igor Lacík	1
			Petra Mazancová	1	Veronika Némethová	1
			Veronika Némethová	3	Igor Novák	2
			Veronika Némethová	1	Silvia Podhradská	1
			Veronika Némethová	1	Michal Procházka	1
			Veronika Némethová	1	Michal Procházka	1
			Filip Rázga	1	Filip Rázga	1
			Filip Rázga	3	Zdenko Špitálsky	2
			Filip Rázga	1		
			Filip Rázga	1		
Čína			Igor Lacík	11		
Katar			Jozef Kollár	30		
			Jaroslav Mosnáček	32		
			Zdenko Špitálsky	46		
Maďarsko			Anita Eckstein	3		
			Ivan Chodák	1		
			Zuzana Kroneková	3		
			Alena Šišková	2		
			Alena Šišková	3		
			Alena Šišková	2		
Nemecko			Igor Lacík	3		
			Miroslava Lukešová	7		
Poľsko	Katarína Borská	6	Peter Cifra	3		
	Martin Danko	6				
	Katarína Mosnáčková	3				
	Alena Šišková	3				
Portugalsko			Zuzana Benková	3		
			Zuzana Benková	52		
Rakúsko					Ivan Chodák	1
					Ivan Chodák	1
					Mária Omastová	1
Rumunsko	Mária Omastová	5	Kristián Peptu	30		
Srbsko			Jaroslav Kuliček	8		
			Zoran Markovic	5		

			Zdenko Špitálsky	6		
Švajčiarsko			Dušan Račko	365		
Taliansko	Alena Šišková	13	Petra Šrámková	13	Igor Lacík	1
			Anna Zahoranová	13		
USA			Igor Lacík	2		
			Igor Lacík	5		
			Igor Lacík	4		
Veľká Británia					Zdenko Špitálsky	4
Počet vyslaní spolu	**7**	**44**	**41**	**835**	**18**	**23**

(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**
Česko	Stejskal J.	5	Čangelová K.	62	Datta Sh.	5
	Trchová M.	5	Kumorek M.	5	Jutkova Am.	5
			Mrlík M.	3	Měřinska D.	2
			Mrlík M.	2	Vlček P.	2
			Osička J.	3		
			Osička J.	2		
Egypt			Nada A.	59		
Irán			Heydar A.	183		
Kanada			Luk Sh.	107		
			Rooney T.	13		
Maďarsko	Iván B.	4				
	Osváth Zs.	4				
	Stumphauser T.	4				
	Szárka G.	4				
Nemecko			Luxenhofer R.	2		
Poľsko	Basko M.	12	Maczugowska P.	61	Dworak A.	2
	Maksymiak M.	6	Maksymiak M.	183		
	Rydz-Pawlak J.	6				
	Sikorska W.	6				
Rumunsko			Kozma E.	44		
Slovinsko			Stankovič N.	30		
Srbsko			Markovic B.	13		
Turecko			Erten S. E.	5		
			Evgin T.	91		
			Goller G.	10		
Ukrajina			Ohar H.	244		
Počet prijatí spolu	**10**	**56**	**20**	**1122**	**5**	**16**

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

Krajina	Názov konferencie	Meno pracovníka	Počet dní
Česko	68. sjezd chemických společností	Nikola Bugárová	4
		Jaroslav Kuliček	4
		Zuzana Nógellová	4
		Igor Novák	4
		Mária Omastová	5
		Michal Procházka	4
	9th International Conference on Pigments and Binde	Igor Novák	2
	Meeting V4: ABIOG	Zuzana Kroneková	2
		Alena Šišková	2
	PLASTKO 2016	Igor Novák	3
	XI. Brněnské hematologické dny	Lucia Kleščíková	1
		Petra Mazancová	1
		Veronika Némethová	1
		Filip Rázga	1
	XXV. Biochemický sjezd	Veronika Némethová	4
		Filip Rázga	4
Čína	CSM 2016	Klaudia Forró	9
		Jaroslav Kuliček	9
Fínsko	Nordic Polymer Days 2016	Mária Omastová	4
	RubberCon 2016	Ivan Chodák	5
Francúzsko	3rd Int. Conf. on Bioinspired and Biobased Chemist	Alena Šišková	5
	N.I.C.E. 2016	Anita Eckstein	5
Grécko	Org.&Per. Solar Cells Conf. and MC/WC Meeting...	Matej Mičušík	6
	Organic&Perovskite Solar Cells Conf. and MC/WC Me	Mária Omastová	6
	POC 2016	Martin Danko	6
		Jozef Kollár	6
Maďarsko	BiPoCo 2016	Ivan Chodák	5
		František Ivanič	5
		Ivica Janigová	5
	LPP 2016	Katarína Borská	5
		Daniela Moravčíková	5
		Jaroslav Mosnáček	2
Nemecko	12th Int.l Workshop on Polym. Reaction Engineering	Anna Chovancová	4
	12th Intern. Workshop on Polym. Reaction Engineeri	Igor Lacík	4
	KHK 2016	Ivan Chodák	5
	Nanobrücken 2016	Michal Procházka	3
Poľsko	6th Int. Seminar on Modern Polym. Mat. for Envir	Mária Omastová	4
	6th Int.l Seminar on Modern Polym. Mat. for Envir	Ivan Chodák	5
	6th Inter. Seminar on Modern Polym. Mat. for Envi	František Ivanič	5

	Graphen Week	Zoran Markovic	7
	POLYMAT 2016	Juraj Kronek	2
		Igor Lacík	2
	XXX. International Scientific Conference - Wood	Igor Novák	4
Portugalsko	24th International Conference on Bioencapsulation	Petra Mazancová	4
		Zuzana Kroneková	4
		Vladimír Raus	4
		Dušana Treľová	4
	2nd International Conference on Mechanics of Compo	Ivan Chodák	6
Rakúsko	27th MassSpec Forum Vienna	Kristián Peptu	2
Španielsko	6th EuCheMS Chemistry Congress	Mária Omastová	6
	Applied Nanotechnology and Nanoscience Inter. Conf	Nikola Bugárová	4
Švédsko	MC Meeting COST Action FP 1205	Kristián Peptu	4
		Alena Šišková	4
	Training School Nanocellulose Shaping	Eliška Číková	4
		Alena Šišková	4
Taliansko	ECIS 2016	Zuzana Benková	5
	Electrospin 2016	Eliška Číková	7
		Alena Šišková	7
	Workshop on Polymers with Spatial and Mechanical C	Peter Cifra	5
Turecko	World Polymer Congress MACRO 2016	Igor Lacík	7
USA	ACS 2016	Juraj Kronek	9
	American Physical Society Meeting	Peter Cifra	8
Veľká Británia	Warwick Polymer Conference 2016	Jaroslav Mosnáček	4
Spolu	**41**	**63**	**281**

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

Skratky použité v tabuľke C:

24th International Conference on Bioencapsulation - 24th International Conference on Bioencapsulation
12th Int.l Workshop on Polym. Reaction Engineering - 12th International Workshop on Polymer Reaction Engineering
12th Intern. Workshop on Polym. Reaction Engineeri - 12th International Workshop on Polymer Reaction Engineering
24th International Conference on Bioencapsulation - 24th International Conference on Bioencapsulation
27th MassSpec Forum Vienna - 27th MassSpec Forum Vienna
2nd International Conference on Mechanics of Compo - 2nd International Conference on Mechanics of Composites
3rd Int. Conf. on Bioinspired and Biobased Chemist - 3rd International Conference on Bioinspired and Biobased Chemistry & Materials N.I.C.E 2016
68. sjezd chemických společností - 68. sjezd chemických společností
6th EuCheMS Chemistry Congress - 6th EuCheMS Chemistry Congress
6th Int. Seminar on Modern Polym. Mat. for Envir - 6th International Seminar on Modern Polymeric Materials for Environmental Applications
6th Int.l Seminar on Modern Polym. Mat. for Envir - 6th International Seminar on Modern Polymeric Materials for Environmental Applications
6th Inter. Seminar on Modern Polym. Mat. for Envi - 6th International Seminar on Modern Polymeric Materials for Environmental Applications
9th International Conference on Pigments and Binde - 9th International Conference on Pigments and Binders
ACS 2016 - ACS 2016 - 252nd American Chemical Society National Meeting & Exposition

American Physical Society Meeting - American Physical Society Meeting
Applied Nanotechnology and Nanoscience Inter. Conf - Applied Nanotechnology and Nanoscience International Conference
BiPoCo 2016 - BiPoCo 2016 - 3rd International Conference on Bio-based Polymers and Composites
CSM 2016 - The International Conference on the Science and Technology of Synthetic Metals-CSM 2016
CSM 2016 - The International Conference on the Science and Technology of Synthetic Metals - CSM 2016
ECIS 2016 - 30th Conference of the European Colloid and Interface Society
Electrospin 2016 - 4th International Conference on Electrospinning 2016 - Electrospin 2016
Graphen Week - Graphen Week
KHK 2016 - KHK 2016 12th Fall Rubber Colloquium
LPP 2016 - World Congress on Living Polymerizations and Polymers LPP 2016
MC Meeting COST Action FP 1205 - MC Meeting COST Action FP 1205
Meeting V4: ABIOG - Meeting V4: Creation of the Advanced Biomaterials Group-ABIOG
N.I.C.E. 2016 - N.I.C.E. 2016 3rd International Conference on Bioinspired and Biobased Chemistry & Materials
Nanobrücken 2016 - Nanobrücken 2016: Nanomechanical Testing Workshop and Hysitron User Meeting
Nordic Polymer Days 2016 - Nordic Polymer Days 2016
Org.&Per. Solar Cells Conf. and MC/WC Meeting... - Organic&Perovskite Solar Cells Conference and MC/WC Meeting of COST Action MP 1307
Organic&Perovskite Solar Cells Conf. and MC/WC Me - Organic&Perovskite Solar Cells Conference and MC/WC Meeting of COST Action MP 1307
PLASTKO 2016 - PLASTKO 2016
POC 2016 - 16th International Conference on Polymers and Organic Chemistry POC 2016
POLYMAT 2016 - POLYMAT 2016 - Silesian Meetings on Polymer Materials
RubberCon 2016 - RubberCon 2016
Training School Nanocellulose Shaping - Training School Nanocellulose Shaping
Warwick Polymer Conference 2016 - Warwick Polymer Conference 2016
Workshop on Polymers with Spatial and Mechanical C - Workshop on Polymers with Spatial and Mechanical Constraints
World Polymer Congress MACRO 2016 - World Polymer Congress MACRO 2016
XI. Brněnské hematologické dny - XI. Brněnské hematologické dny
XXV. Biochemický sjezd - XXV. Biochemický sjezd
XXX. International Scientific Conference - Wood - XXX. International Scientific Conference - Wood Material of the XXIst Century