

Current Projects:

- **Photochemically induced copper-mediated atom transfer radical polymerization – VIS-CuM**
Project of Slovak R&D Agency SRDA-15-0545
Research period: 2016-2020, *Principal Investigator*
- **Nanoparticles-based sensors of gaseous biomarkers of diseases - NANOSEN**
Project of Slovak R&D Agency SRDA-14-0891
Research period: 2015-2019, *Coordinator* for the Polymer Institute SAS
- **Effects of nanoencapsulated simvastatin on cardiovascular system in experimental metabolic syndrome - NANOSIMCA**
Project of Slovak R&D Agency SRDA-14-0932
Research period: 2015-2019, *Coordinator* for the Polymer Institute SAS
- **Biochips and biosensors for glycorecognition, their development, preparation and application in cancer research - BIOGLYCO**
Project of Slovak R&D Agency SRDA-14-0753
Research period: 2015-2019, *Coordinator* for the Polymer Institute SAS
- **Synthesis of well-defined novel copolymers by use of living polymerization methods and advanced chromatography techniques**
Project SAS-MOST JRP 2014-9
Research period: 2015-2017, *Coordinator* for the Polymer Institute SAS

List of publications:

2016

1. P. Kasák, J. Mosnáček, M. Danko, I. Krupa, G. Hloušková, D. Chorvát Jr., M. Koukaki, S. Karamanou, A. Economou, I. Lacík „**A polysulfobetaine hydrogel for immobilization of a glucose-binding protein**”, RSC Adv., Vol. 6, p. 83890-83900 (2016).
2. J. Kollár, M. Mrlík, D. Moravčíková, Z. Kroneková, T. Liptaj, I. Lacík, J. Mosnáček „**Tulips: A renewable source of monomer for superabsorbent hydrogels**”, Macromolecules, Vol. 49, p. 4047-4056 (2016).
3. K. Mosnáčková, A. Šišková, I. Janigová, J. Kollár, M. Šlosár, Š. Chmela, P. Alexy, I. Chodák, J. Bočkaj, J. Mosnáček „**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**”, Chem. Papers, Vol. 70, p. 1268-1278 (2016).
4. C.-F. Huang, S.-W. Kuo, D. Moravčíková, J.-C. Liao, Y.-M. Han, T.-H. Lee, P.-H. Wang, R.-H. Lee, R. C.-C. Tsiang, J. Mosnáček „**Effect of variations of $Cu^I X_2/L$, surface area of Cu^0 , solvent, and temperature on atom transfer radical polyaddition of 4-vinylbenzyl 2-bromo-2-isobutyrate imers**”, RSC Adv., Vol. 6, p. 51816-51822 (2016).
5. M. Ilčíková, M. Danko, M. Doroshenko, A. Best, M. Mrlík, K. Csomorová, M. Šlouf, D. Chorvát Jr., K. Koynov, J. Mosnáček „**Visualization of carbon nanotubes dispersion in composite by using confocal laser scanning microscopy**”, Eur. Polym. J., Vol. 79, p. 187-197 (2016).
6. M. Mrlík, M. Ilčíková, T. Plachy, V. Pavlínek, Z. Špitalský, J. Mosnáček „**Graphene oxide reduction during surface-initiated atom transfer radical polymerization of glycidyl methacrylate: Controlling electro-responsive properties**”, Chem. Eng. J., Vol. 283, p. 717-720 (2016).

2015

7. A. Szymczyk, S. Paszkiewicz, I. Pawelec, S. Lisiecki, M. Jotko, Z. Špitalský, J. Mosnáček, Z. Roslaniec „**Oxygen Barrier Properties and Melt Crystallization Behavior of Poly(ethylene terephthalate)/Graphene Oxide Nanocomposites**”, J. Nanomaterials, Article ID 382610, 10 pages (2015).
8. M. Cvek, M. Mrlík, M. Ilčíková, J. Mosnáček, V. Babayan, Z. Kuceková, P. Humpolíček, V. Pavlínek „**The chemical stability and cytotoxicity of carbonyl iron particles grafted with poly(glycidyl methacrylate) and the magnetorheological activity of their suspensions**”, RSC Adv., Vol. 5, p. 72816-72824 (2015)
9. S. Paszkiewicz, I. Pawelec, A. Szymczyk, Z. Spitalsky, J. Mosnacek, A. Kochmanska, Z. Roslaniec „**Effect of exfoliated graphite nanoplatelets' size on the phase structure, electrical, and barrier properties of poly(trimethylene terephthalate)-based nanocomposites**”, Polym. Eng. Sci., Vol. 55, p. 2222-2230 (2015).
10. M. Ilčíková, M. Mrlík, T. Sedláček, M. Doroshenko, K. Koynov, M. Danko, J. Mosnáček „**Tailoring of viscoelastic properties and light-induced actuation performance of triblock copolymer composites through surface modification of carbon nanotubes**”, Polymer, Vol. 72, p. 368-377 (2015).
11. G. Kasza, K. Mosnackova, A. Nador, Z. Osvath, T. Stumphauer, G. Szarka, K. Czanikova, J. Rychly, Š. Chmela, B. Ivan, J. Mosnacek „**Synthesis of hyperbranched poly(ethyleneimine) based macromolecular antioxidants and investigation of their efficiency in stabilization of polyolefins**”, Eur. Polym. J., Vol. 68, p. 609-617 (2015).

12. Cs. Kosa, M. Sedlacik, A. Fiedlerova, Š. Chmela, K. Borska, J. Mosnacek „**Photochemically cross-linked poly(ϵ -caprolactone) with accelerated hydrolytic degradation**”, Eur. Polym. J., Vol. 68, p. 601-608 (2015).
13. M. Cvek, M. Mrlík, M. Ilčíková, T. Plachy, M. Sedlacik, J. Mosnacek, V. Pavlinek „**A facile controllable coating of carbonyl iron particles with poly(glycidyl methacrylate): a tool for adjusting MR response and stability properties**”, J. Mater. Chem. C, Vol. 3, p. 4646 (2015).
14. J. Rychlý, K. Mosnáčková, L. Rychlá, Fiedlerová A., G. Kasza, A. Nádor, Z. Osváth, T. Stumphauer, G. Szarka, K. Czaničková, Š. Chmela, B. Iván, J. Mosnáček „**Comparison of the UV stabilisation effect of commercially available processing stabilizer Irganox HP 136 with Irganox 1010 and synthesized hyperbranched phenolic antioxidants**”, Polym. Degrad. Stab., Vol. 118, p. 10-16 (2015).
15. J. Mosnacek, A. Andicsová-Eckstein, K. Borska „**Ligand Effect and Oxygen Tolerance Studies in Photochemically Induced Copper Mediated Reversible Deactivation Radical Polymerization of Methyl Methacrylate in Dimethyl Sulfoxide**”, Polym. Chem., Vol. 6, p. 2523-2530 (2015).
16. L. Klukova, T. Bertok, M. Petrikova, A. Sediva, D. Mislovicova, J. Katrlík, A. Vikartovska, J. Filip, P. Kasák, A. Andicsová-Eckstein, J. Mosnáček, J. Lukác, J. Rovensky, R. Imrich, J. Tkac „**Glycoprofiling as a novel tool in serological assays of systemic sclerosis: A comparative study with three bioanalytical methods**”, Anal. Chim. Acta, Vol. 853, p. 555-562 (2015).
17. M. Ilčíková, M. Mrlík, Z. Špitalský, M. Mičušík K. Csomorová, V. Sasinková, A. Kleinová, J. Mosnáček „**A tertiary amine in two competitive processes: reduction of graphene oxide vs. Catalysis of Atom Transfer Radical Polymerization**”, RSC Adv., Vol. 5, p. 3370-3376 (2015).

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18. S. Teixeira, M. P. Graça, M. Dionisio, M. Ilčíková, J. Mosnáček, Z. Špitalský, I. Krupa, L. Costa „**Self-standing elastomeric composites based on lithium ferrites and their dielectric behavior**”, J. Appl. Phys. Vol. 114, art. 224102 (2014).
19. S. Paszkiewicz, M. Nachman, A. Szymczyk, Z. Špitalský, J. Mosnáček, Z. Roslaniec „**Influence of expanded graphite (EG) and graphene oxide (GO) on physical properties of PET based nanocomposites**”, Pol. J. Chem. Tech., Vol.16 (4), p. 45-50 (2014).
20. J. Mosnáček, A. Kundys, A. Andicsová „**Reversible-deactivation radical polymerization of methyl methacrylate induced by photochemical reduction of various copper catalysts**”, Polymers, Vol. 6 (10), p. 2862-2874 (2014).
21. M. Ilčíková, M. Mrlík, T. Sedláček, M. Šlouf, A. Zhigunov, K. Koynov, J. Mosnáček „**Synthesis and photoactuating acrylic thermoplastic elastomers containing diblock copolymer-grafted carbon nanotubes**”, ACS Macro Lett., Vol. 3, p. 999-1003 (2014).
22. K. Borska, M. Danko, J. Mosnacek „**Photodegradation and Photochemical Cross-linking of Polylactide**”, Chem. Listy, Vol. 108, p. 1030-1039 (2014).
23. M. Ilčíková, J. Mosnáček, M. Mrlík, T. Sedláček, K. Csomorová, K. Czaničková, I. Krupa „**Influence of surface modification of carbon nanotubes on interactions with polystyrene-*b*-polyisoprene-*b*-polystyrene matrix and its photo-actuation properties**”. Polym. Adv. Technol., Vol. 25, p. 1293-1300 (2014).
24. M. Mrlík, M. Ilčíková, M. Sedlacik, J. Mosnáček, P. Peer, P. Filip „**Cholesteryl-coated carbonyl iron particles with improved anti-corrosion stability and their viscoelastic behaviour under magnetic field**”, Colloid Polym. Sci., Vol. 292, p. 2137-2143 (2014).
25. S. Paszkiewicz, A. Szymczyk, Z. Špitalský, J. Mosnáček, K. Kwiatkowski, Z. Roslaniec „**Structure and properties of nanocomposites based on PTT-block-PTMO copolymer and graphene oxide prepared by in situ polymerization**”, Eur. Polym. J., Vol. 50, p. 69-77 (2014).

26. M. Ilcikova, M. Mrlik, T. Sedlacek, D. Chorvat, I. Krupa, M. Slouf, K. Koynov, J. Mosnacek „**Viscoelastic and Photo-Actuation Studies of Composites Based on Nanotubes and Styrene-*b*-Isoprene-*b*-Styrene Block Copolymer Polystyrene-Grafted Carbon**”, *Polymer*, Vol. 55, p. 211-218 (2014).

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27. S. Paszkiewicz, A. Szymczyk, Z. Spitalsky, J. Mosnacek, E. Janus, Z. Roslaniec „**Influence of Expanded Graphite on Synthesis Progress and Characteristic of PETG**”, *Polimery*, 58 (11-12), p. 893-899 (2013).
28. K. Czanikova, M. Ilcikova, I. Krupa, M. Micusik, P. Kasak, E. Pavlova, J. Mosnacek, D. Chorvat, Jr., and M. Omastova „**Elastomeric Photo-actuators and their Investigation by Confocal Laser Scanning Microscopy**”, *Smart Mater. Struct.*, Vol. 22, art. 104001 (2013).
29. J. Mosnacek, K. Borska, M. Danko, I. Janigova „**Photochemically Promoted Degradation of Poly(ϵ -caprolactone) Film**”, *Mater. Chem. Phys.*, Vol. 140 (1), p. 191-199 (2013).
30. M. Mrlik, M. Ilcikova, V. Pavlinek, J. Mosnacek, P. Peer, P. Filip „**Improved thermooxidation and sedimentation stability of covalently-coated carbonyl iron particles with cholesteryl groups and their influence on magnetorheology**”, *J. Colloid Interface Sci.*, Vol. 396, p. 146-151 (2013).
31. I. Novak, M. Steviar, A. Popelka, I. Chodak, J. Mosnacek, M. Spirikova, I. Janigova, A. Kleinova, J. Sedliacik, J. Slouf „**Surface Modification of Polyethylene by Diffuse Barrier Discharge Plasma**”, *Polym. Eng. Sci.*, Vol. 53 (3), p. 516–523 (2013).
32. J. Mosnacek, I. Lukac, M. Bertoldo, F. Ciardelli „**Applicability of photochemically generated pendant benzoyl peroxides in both “grafting from” and “grafting to” techniques**”, *Chem. Papers*, Vol. 67 (1), p. 9-17 (2013).

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33. M. Brzezinski, M. Boguslawska, M. Ilcikova, J. Mosnacek, T. Biela „**Unusual Thermal Properties of Polylactides and Polylactide Stereocomplexes Containing Polylactide-Functionalized Multi-Walled Carbon Nanotubes**”, *Macromolecules*, Vol. 45, p. 8714-8721 (2012).
34. S. Paszkiewicz, A. Szymczyk, Z. Spitalsky, M. Soccio, J. Mosnacek, T. A. Ezquerro and Z. Roslaniec „**Electrical conductivity of poly(ethylene terephthalate)/expanded graphite nanocomposites prepared by *in situ* polymerization**”, *J. Polym. Sci. B: Polym. Phys.*, Vol. 50 (23), p. 1645-1652 (2012).
35. K. Czanikova, I. Krupa, M. Ilcikova, P. Kasak, D. Chorvat, Jr., M. Valentin, M. Slouf, J. Mosnacek, M. Micusik, M. Omastova „**Photo-actuating materials on the base of elastomers and modified carbon nanotubes**”, *J. Nanophoton.*, Vol. 6 (1), 063522 (2012).
36. J. Mosnacek, M. Ilcikova „**Photochemically Mediated Atom Transfer Radical Polymerization of Methyl Methacrylate Using ppm Amounts of Catalyst**”, *Macromolecules*, Vol. 45 (15), p. 5859–5865 (2012).
37. R. Nicolay, J. Mosnacek, K. K. Kar, S O. Fruchey, M. D. Cloeter, R. S. Harner, K. Matyjaszewski „**Efficient Polymerization Inhibition Systems for Acrylic Acid Distillation: Vapor Phase Inhibitors**”, *Ind Eng Chem Res*, Vol. 51 (12), p. 4467–4471 (2012).
38. J. Mosnacek, R. Nicolay, K. K. Kar, S O. Fruchey, M. D. Cloeter, R. S. Harner, K. Matyjaszewski „**Efficient Polymerization Inhibition Systems for Acrylic Acid Distillation: New Liquid Phase Inhibitors**”, *Ind Eng Chem Res*, Vol. 51 (10), p. 3910–3915 (2012).

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39. Z. Spitalsky, M. Danko, J. Mosnacek „**Preparation of Functionalized Graphene Sheets**”, *Curr. Org. Chem.*, Vol. 15, p. 1133-1150 (2011).
40. A. Juhari, J. Mosnacek, J. A. Yoon, A. Nese, Koynov, T. Kowalewski, K. Matyjaszewski „**Star-like Poly(n-butyl acrylate)-b-poly(alpha-methylene-gamma-butyrolactone) Block Copolymers for High Temperature Thermoplastic Elastomers Applications**”, *Polymer*, 51 (21), p. 4806–4813 (2010).
41. A. Nese, J. Mosnacek, A. Juhari, J. A. Yoon, K. Koynov, T. Kowalewski, K. Matyjaszewski „**Synthesis, Characterization, and Properties of Starlike Poly(n-Butyl Acrylate)-b-Poly(Methyl Methacrylate) Block Copolymers**”, *Macromolecules*, Vol. 43 (3), p. 1227-1235 (2010).
42. M. A. Bahattab, J. Mosnacek, A. A. Basfar, T. M. Shukri „**Cross-linked Poly(Ethylene Vinyl Acetate) (EVA) / Low Density Polyethylene (LDPE) / Metal Hydroxides Composites for Wire and Cable Applications**”, *Polym. Bull.*, Vol. 64 (6), p. 569-580 (2010).
43. J. Mosnacek, J. A. Yoon, A. Juhari, K. Koynov, K. Matyjaszewski „**Synthesis, Morphology and Mechanical Properties of Linear Triblock Copolymers Based on Poly(α -Methylene- γ -Butyrolactone)**”, *Polymer*, Vol. 50, p. 2087-2094 (2009).
44. J. Mosnacek, A. A. Basfar, T. M. Shukri, M. A. Bahattab „**Poly(Ethylene Vinyl Acetate) (EVA) / Low Density Polyethylene (LDPE) / Ammonium Polyphosphate (APP) Composites Cross-linked by Dicumyl Peroxide for Wire and Cable Applications**”, *Polym. J.*, Vol. 40, p. 460 – 464 (2008).
45. J. Mosnacek, K. Matyjaszewski „**Atom Transfer Radical Polymerization of Tulipalin A – A Naturally Renewable Monomer**”, *Macromolecules*, Vol. 41, p. 5509-5511 (2008).
46. T. M. Shukri, J. Mosnacek, A. A. Basfar, M. A. Bahattab, P. Noireaux, A. Coudreuse „**Flammability of Blends of Low Density Polyethylene (LDPE) and Ethylene Vinyl Acetate (EVA) Cross-linked by Both Dicumyl Peroxide and Ionizing Radiation for Wire and Cable Applications**”, *J. App. Polym. Sci.*, Vol. 109, p. 167 – 173 (2008).
47. A. A. Basfar, J. Mosnacek, T. M. Shukri, M. A. Bahattab, P. Noireaux, A. Coudreuse „**Mechanical and Thermal Properties of Blends of Low Density Polyethylene (LDPE) and Ethylene Vinyl Acetate (EVA) Cross-linked by Both Dicumyl Peroxide and Ionizing Radiation for Wire and Cable Applications**”, *J. App. Polym. Sci.*, Vol. 107, p. 642 – 649 (2008).
48. Cs. Kosa, J. Mosnacek, A. Bilesova, P. Kasak, J. Kronek, M. Danko, J. Kollar „**Synthesis, Oxidation and Photophysical Properties of Novel Derivatives of Acyclic Aromatic Amines**”, *Collect. Czech. Chem. Commun.*, Vol. 72 (9), p. 1255 – 1268 (2007).
49. M. Florczak, J. Libiszowski, J. Mosnacek, A. Duda, S. Penczek „**L,L-Lactide and ϵ -Caprolactone Block Copolymers by ‘Poly(L,L-lactide) Block First’ Route**”, *Macromol. Rapid Comm.*, Vol. 28, p.1385 – 1391 (2007).
50. J. Mosnacek, M. Bertoldo, Cs. Kosa, C. Cappelli, G. Ruggeri, I. Lukac, F. Ciardelli „**Modification and Photostabilization of LDPE Film by Photodecomposition of Various Diazo-compounds and Methyl Azidocarboxylate**”, *Polym. Degrad. Stab.*, Vol. 82, p.849 – 858 (2007).
51. I. Novak, M. Steviar, I. Chodak, I. Krupa, T. Nedelcev, M. Spirkova, M. M. Chehimi, J. Mosnacek, A. Kleinova „**Study of Adhesion and Surface Properties of Low-density Polyethylene Pre-treated by Cold Discharge Plasma**”, *Polym. Adv. Technol.*, Vol. 18 (2), p. 97 – 105 (2007).
52. Cs. Kosa, J. Mosnacek, I. Lukac, P. Hrdlovic, S. Chmela, W. D. Habicher „**Photooxidation of Benzil Groups in the Presence of Hindered Amine Stabilizers in the Polystyrene Film**”, *J. App. Polym. Sci.*, Vol. 100, p. 4420 – 4428 (2006).

53. A. Duda, J. Libiszowski, J. Mosnacek, S. Penczek, „**Copolymerization of Cyclic Esters at the Living Polymer-Monomer Equilibrium**“, *Macromol. Symposia*, Vol. 226, p. 109 – 120 (2005).
54. J. Mosnacek, I. Lukac, „**Methods of Preparation of α -Diketones and Monomers with α -Dicarbonyl Moiety (Možnosti přípravy α -diketónov a monomérov obsahujúcich α -dikarbonylovú skupinu)**“, *Chemicke listy*, Vol. 99, p. 421 – 430 (2005).
55. J. Mosnacek, A. Duda, J. Libiszowski, and S. Penczek, „**Copolymerization of LL-Lactide at Its Living Polymer-Monomer Equilibrium with ϵ -Caprolactone as Comonomer**“, *Macromolecules*, Vol. 38, Issue 6, p. 2027 – 2029 (2005).
56. J. Mosnacek, R. G. Weiss, I. Lukac, „**Preparation of 4-Vinylbenzil and Photochemical Properties of Its Homopolymer and Copolymer with Styrene**“, *Macromolecules*, Vol. 37, p. 1304-1311 (2004).
57. J. Mosnacek, I. Lukac, S. Chromik, I. Kostic, P. Hrdlovic, „**Network Formation of Phenylvinylketone Copolymer with 4-Vinylbenzil and Its Photodecrosslinking in Films**“, *J. Polymer Sci. A: Polymer Chemistry*, Vol. 42, p. 765-771 (2004).
58. J. Mosnacek, S. Chmela, G. Theumer, W. D. Habicher, P. Hrdlovic, „**New Combined Phenol/HAS Photo- and Thermo-stabilizers Based on Toluene 2,4-Diisocyanate**“, *Polym.Degrad. Stab.*, Vol. 80, Issue 1, p. 113-126 (2003).
59. J. Mosnacek, I. Lukac, „**Irradiation of Camphorquinone in Glassy Polymer Matrices in the Absence and Presence of Molecular Oxygen**“, *J. Photochem. Photobiol. A, Chem.*, Vol. 151 Issue 1-3, p. 95 - 104 (2002).
60. J. Mosnacek, R. G. Weiss, I. Lukac, „**Photochemical Transformation of Benzilcarbonyl Pendant Groups in Polystyrene Copolymers to Benzoyl Peroxide Carbonyl Moieties and the Consequences of Their Thermal and Photochemical Decomposition**“, *Macromolecules*, Vol. 35, Issue 10, p. 3870 – 3875 (2002).

Book Chapters:

1. M. Mrlík, M. Ilčíková, J. Mosnáček, V. Pavlínek „**Modification of Carbon Nanotubes: Improvement of Physical and Photo-Actuating Properties of their Elastomeric Composites**“, In *Research and Innovation in Carbon Nanotube-Based Composites*, Dr. Brahim Attaf (Ed.), publisher: The World Academic Publishing Co., Ltd. – AMSA, **2015**. ISBN 978-0-9889190-1-3. <http://www.academicpub.org/amsa/>
2. M. Ilčíková, M. Mrlík, J. Mosnáček Chapter 6: „**Thermoplastic elastomers with photoactuating properties**“. In *Thermoplastic Elastomers - Synthesis and Applications*. Publisher: InTech d.o.o, Rijeka, Croatia. Edited by Chapal Kumar Das, **2015**, p.115-143, ISBN 978-953-51-2223-4.

Patents:

1. M. D. Cloeter, K. K. Kar, K. Matyjaszewski, J. Mosnacek, R. Nicolay, „**Synergistic polymerization inhibitor composition and method**“. Patent Application **WO2012121836 (A1)**
2. K. K. Kar, O. S. Fruchey, M. D. Cloeter, R. S. Harner, K. Matyjaszewski, R. Nicolay, J. Mosnacek, „**Polymerization Inhibitor Composition and Method of Inhibiting Polymerization of Distillable Monomers**“. Patent Applications **WO 2010096512 (A1); US2011290635 (A1); EP2398832 (A1); CN102325800 (A)**

3. I. Lukac, J. Mosnacek, „**Methods for the Preparation of 1-Phenyl-2-(4-vinylphenyl)-1,2-ethanedione Monomer, the Polymers Thereof and Diacyl Peroxide Groups Created Therein**“. Slovak Patent Application **SK4482002**