Curriculum Vitae Martin Danko

Staff: Martin Danko, PhD
Deputy Head of the Department of Synthesis and Characterization of Polymers
E-mail: upoldan@savba.sk, martin.danko@savba.sk; Skype: dankomatko
tel.: +421 2 3229 4353

Born in 1974 in Piešťany, Slovakia
Status: married, two children

Education:

- **MSc in Organic chemistry** (6/1997), Faculty of Natural Sciences Comenius University in Bratislava. Title: *Synthesis and characterization of bifunctional fluorescent probes*, Polymer Institute SAS under supervising of Štefan Chmela, DSc.
- **PhD in Macromolecular chemistry** (2001), Polymer Institute SAS Bratislava. Title: *Preparation of Fluorescence Probes and their Utilization to the Characterization of IPN networks* under supervising of Prof. Eberhard Borsig and Prof. Pavol Hrdlovič.

Positions:

- From 2000 - Research scientist on Polymer Institute of the Slovak Academy of Sciences (PISAS) in the Department of Polymer Reaction.
- From 05/2005 - Research scientist - the Head of the Department of Photochemistry of Polymers in PISAS Bratislava.
- From 05/2011–present - deputy of the Head of newly formed Department of Synthesis and Characterization of Polymers in PISAS.
- 15 month post-doc stay (two stays between years 2002-2004) in the Center of Molecular and Macromolecular Studies of the Polish Academy of Sciences under supervising of the prof. Andrzej Duda and prof. Stanislaw Penczek.
- 2 month (10-11/2015) visiting professor position in the Center for Advanced Materials Qatar University, Doha, Qatar

Research interest:

His current research interests are focused on the following topics:

- photochemical and photophysical processes in polymer materials - expert in fluorescence spectroscopy. The topics of the interest are mainly radical processes related to photo- and thermo-oxidation of the polyolefines and biodegradable polyesters in relation with their further biodegradability and mineralization, dynamics of the polymers in solution, characterization of the water-soluble polymers in the presence of their monomers and spectral characterization of Donor-Acceptor chromophores for application in photonics all followed by steady-state and time-resolved fluorescence spectroscopy.
- preparation of special monomers and low-molecular weight bifunctional fluorescence probes suitable for various polymer and hybrid systems characterization.

- Ring-opening polymerization and co-polymerization of cyclic lactones for preparation of functional polyesters based on lactide, caprolactone and butyrolactones and their copolymers. Functionalization of biocompatible and biodegradable polyesters for crosslinking and degradation (mineralization) studies.
- Development of technological process at preparation of polylactide in small scale (0.5 – 1 kg) – cooperation with small chemical company Tauchem, s.r.o. Bratislava
- Stabilization and degradation of polyolefines and polyesters, chemical and physical study of hindered amine stabilizers

Technical skills, instrumentations:

- Synthesis of low-molecular compounds – monomers;
- Preparation of various polymers (meth(acrylates), vinyl, biodegradable and biocompatible polyesters by controlled radical and ring-opening polymerizations;
- Modification of polymers – polymer analog reactions;
- UV-Vis and steady-state and time-correlated fluorescence spectroscopy;
- Chromatographic technics and analysis (GPC, GC-MS, NMR, FTIR, MALDI DSC, DMTA);
- Glass working – construction of glass apparatus and reaction vessels for vacuum operations and oxygen/moisture free reactions.
- Biodegradation of polymers, mineralization – measurement of CO_2 evolution during degradation of polymers;
- Languages: English – active, Polish – active
- PC skills: MS office, Origin, Omnic, MestreNova, ChemDraw, ACD labs

Affiliations:

- Slovak Chemical Society, member since 1998 and chairman, of the Polymer section working group since 2013;
- 11/2005 – present - Member of the Scientific Council of the PISAS;
- Member of commissions for PhD study in Technology of polymer materials – 2011-2015, in Macromolecular chemistry – 2015-present;

Grants, Honors and Awards:

- 2010 - **Slovak Research team of the Year** – member of the team (The prize of Ministry of Education of the Slovak republic).
- 2007 - **Slovak Young Researcher of the Year** (The prize of Vice-premier and Ministry of Education of the Slovak republic).
- 2006 - Awards of Presidium of the Slovak Academy of Sciences, 3rd place in competition of young scientists of SAS.
- 2002 and 2004 - Grants of European Commission within 5th Framework Program for post-doc in CMMS PAS in Lodz, Poland

Current and recent projects:

1. *Photochemically active systems and probes for polymer research* - Project of the scientific grant agency of the Ministry of Education of the Slovak Republic and of Slovak Academy of Sciences VEGA 2/0112/13, Research period: 2013-2016, **Principal investigator**
2. *Synthesis of functionalized biocompatible polyester copolymers.* - Bilateral project between Slovak Academy of Sciences and Polish Academy of Sciences, Research period: 2016-2018, **Coordinator on the PISAS**;
3. *Photochemically induced copper-mediated atom transfer radical polymerization* - Project of Slovak R&D Agency SRDA-15-0545, Research period: 07/2016-06/2020, member of the research team
4. *Modified polymers from renewable resources and their degradation* - Project of Slovak R&D Agency SRDA-15-0528, Research period: 07/2016-04/2020, member of the research team
5. *Effects of nanoencapsulated simvastatin on cardiovascular system in experimental metabolic syndrome* - Project of Slovak R&D Agency SRDA-14-0932, Research period: 07/2015-06/2019, cooperation with Institute of Standard and Pathological Physiology SAS, member of the research team
6. *Photoactive hybrid nanomaterials with luminescent and antimicrobial properties* - Project of Slovak R&D Agency SRDA-0291-11, Research period: 2012-2015, cooperation with Institute of Inorganic Chemistry SAS, **principal investigator from PISAS**
7. *Living/controlled polymerizations:Optimization of polymerization process toward well-defined polymers with targeted architecture and properties* - Project of Slovak R&D Agency SRDA-0109-10, Research period: 2011-2014, member of the research team;
8. *Light sensitive low molecular and macromolecular systems as basis for construction of novel types of probes and modification of polymers* - Project of the scientific grant agency of the Ministry of Education of the Slovak Republic and of Slovak Academy of Sciences VEGA 2/0097/09, Research period: 2009-2011, **Principal investigator**
9. *Synthesis and characterization of advanced polymer and biopolymer materials – SYNADPOL* - Project within the Central and East European Polymer Network (CEEPN), Joint Polish-Slovak laboratory established on January 1, 2008, **Supervisor** of the Slovak laboratory

Colaborations:

- ***Prof. A. Duda***

Centre of Molecular and Macromolecular Studies, Polish Academy of Sciences, Lodz, Poland

- ***T. Biela, DSc.***

Centre of Molecular and Macromolecular Studies, Polish Academy of Sciences, Lodz, Poland

- ***Prof. A. Dworak***

Centre of Polymer and Carbon Materials, Polish Academy of Sciences, Zabrze, Poland;

- ***Prof. Anton Gáplovský***

Institute of Chemistry, Faculty of Natural Sciences, Comenius University, Bratislava, Slovakia

- ***Assoc. Prof. K. Koynov***

Max-Planck Institute, Mainz, Germany

- ***Assoc. Prof. J. Bujdák***

Institute of Inorganic Chemistry, Slovak Academy of Sciences, Bratislava, Slovakia

- ***Assoc. Prof. F. Bureš***

Institute of Organic Chemistry and Technology, Faculty of Chemical Technology, University of Pardubice, Czech Republic

- ***Assoc. Prof. D. Végh***

Department of Organic Chemistry, Slovak University of Technology, Bratislava, Slovakia

- ***Ing. Vladimír Žvak***

Tauchem, s.r.o., Bratislava, Slovakia

Publications: **35** WoS+Scopus publications, **2** book chapters, **2** SCI extended proceedings, 302 citations total (203 without self-citation), Hirsch index 9

1. P. Kasák, J. Mosnáček, **M. Danko**, I. Krupa, G. Hloušková, D. Chorvát, M. Koukaki, S. Karamanou, A. Economou, I. Lacík, A polysulfobetaine hydrogel for immobilization of a glucose-binding protein. RSC Advances, 2016, 6, 83890-83900. doi: 10.1039/c6ra14423c;
2. 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. *European Polymer Journal*, **2016**, 79, 187-197. doi:10.1016/j.eurpolymj.2016.02.015
3. 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*, **2015**, 72, 368-377. doi:10.1016/j.polymer.2015.03.060
4. S. Sas, **M. Danko**, K. Lang, J. Bujdák, Photoactive hybrid material based on kaolinite intercalated with a reactive fluorescent silane, *Applied Clay Science,* **2015**, 108, 208-214. http://dx.doi.org/10.1016/j.clay.2015.02.031
5. **M. Danko**, P. Kasák, P. Hrdlovič, The interactions of probes based on substituted pyrene derivatives in polymer matrices; spectral study. *Journal of Photochemistry and Photobiology A: Chemistry*, **2015**, 307, 79-87. doi: 10.1016/j.jphotochem.2015.04.008
6. K. Borská, **M. Danko**, J. Mosnáček, Fotodegradácia a fotochemické sieťovanie polylaktidu, *Chemické Listy,* **2014**, 108, 1030-1039.
7. J. Kulhánek, F. Bureš, O. Pytela, F. Pippig, **M. Danko**, T. Mikysek, Z. Padělková, M. Ludwig, Quadrupolar D-π-A-π-D chromophores with central tetrafluorobenzene acceptor and two peripheral *N*,*N*-dimethylamino and methoxy donors, *Journal of Fluorine Chemistry,* **2014**, 161, 15-23, http://dx.doi.org/10.1016/j.jfluchem.2014.02.002
8. M. Cigáň, **M. Danko**, J. Donovalová, J. Gašpar, H. Stankovičová, A. Gáplovský, P. Hrdlovič, 3-(7-Dimethylamino)coumarin *N*-phenylsemicarbazones in solution and polymer matrices: Tuning their fluorescence via para-phenyl substitution, *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy,* **2014**, 126, 36 - 45, http://dx.doi.org/10.1016/j.saa.2014.01.127
9. **M. Danko**, A. Andicsová, P. Hrdlovič, D. Račko, D. Végh, Spectral Characteristics of Carbonyl Substituted 2,2'-Bithiophenes in Polymer Matrices and Low Polar Solvents, *Photochemical and Photobiological Sciences, **2013**, 12 (7), 1210-1219*, doi: 10.1039/c3pp50049g
10. J. Mosnáček, K. Borská, **M. Danko**, I. Janigová, Photochemically promoted degradation of poly(ε-caprolactone) film, *Materials Chemistry and Physics*, 140, **2013**, 191-199, doi: 10.1016/j.matchemphys.2013.03.021
11. V. Lukeš, **M. Danko**, A. Andicsová, P. Hrdlovič, D. Végh, The synthesis and examination of spectral properties of some 2,2-bithienyl derivatives with carbonyl-containing substituents, *Synthetic Metals*, **2013**, 165(1), 17-26. Doi: 10.1016/j.synthmet.2012.12.021
12. **M. Danko**, M. Mičušík, M. Omastová, J. Bujdák, D. Chorvát, Jr., Spectral characterisation of new organic fluorescent dyes with an alkoxysilane moiety and their utilisation for the labelling of layered silicates, *Chemical Papers*, **2013**, 67(1), 18-28. Doi: 10.2478/s11696-012-0249-9
13. Mosnáček, J., Mosnáčková, K., Rychlý, J., Chmela, Š., **Danko, M.,** Kollár, J.,Lacík, I., Structural changes of LDPE mulching foils after one season of application. In Natural and Artificial Ageing of Polymers: 6th European Weathering Symposium: Bratislava, 11th - 13th September 2013: CEEES Publication no. 16. - Pfinztal, Germany : Gesselschaft fur Umweltsimulation e.V. GUS, **2013**, p. 173 - 183. ISBN 978-3-9813136-8-0.
14. J. Bujdák, **M. Danko**, D. Chorvát Jr., A. Czímerová, J. Sýkora, K. Lang, Selective modification of layered silicate nanoparticles edges with fluorophores, *Applied Clay Science*, **2012**, 65-66, 152-157. Doi:10.1016/j.clay.2012.04.029
15. C. Kósa, **M. Danko**, P. Hrdlovič, Preparation and Spectral Characterization of Fluorescence Probes Based on 4-*N*,*N*-Dimethylamino Benzoic Acid and Sterically Hindered Amines, *Journal of Fluorescence*, **2012**, 22 (5), 1371-1381. Doi:10.1007/s10895-012-1076-7
16. **M. Danko**, F. Bureš, J. Kulhánek, P. Hrdlovič, Spectral Properties of Y-Shaped Donor-Acceptor Push-Pull Imidazole-based Fluorophores: Comparison between Solution and Polymer Matrices, *Journal of Fluorescence*, **2012**, 22 (4), 1165-1176. Doi:10.1007/s10895-012-1056-y
17. J. Donovalová, M. Cigáň, H. Stankovičová, J. Gašpar, **M. Danko,** A. Gáplovský, P. Hrdlovič, Spectral Properties of Substituted Coumarins: Comparison in Solution and Polymer Matrices, *Molecules* **2012**, *17 (3)*, 3259-3276. doi:10.3390/molecules17033259
18. **M. Danko**, A. Andics, C. Kosa, P. Hrdlovič, D. Vegh, Spectral Properties of Chalcone Containing Triphenylamino Structural Unit in Solution and in Polymer Matrices, *Dyes and Pigments*, 92(3), 1257-1265, (**2012**). doi:10.1016/j.dyepig.2011.07.011
19. **M. Danko**, P. Hrdlovič, Š. Chmela, The photolysis in polymer matrices of dyes containing a benzothioxanthene chromophore linked with a hindered amine, *Polymer Degradation and Stability*, 96, 1955-1960, (**2011**).
20. **Danko M.**, Szabo E., Hrdlovic P., Synthesis and Spectral Characteristics of Fluorescent Dyes Based on Coumarin Fluorophore and Hindered Amine Stabilizer in Solution and Polymer Matrices, *Dyes and Pigments*, 90(2) (**2011**), 129-138.
21. Z. Spitalsky, **M. Danko**, J. Mosnacek, Preparation of Functionalized Graphene Sheets, *Current Organic Chemistry*, 15(8) (**2011**), 1133-1150.

22. **M. Danko**, P. Hrdlovic, J. Kulhanek, F. Bures, Push-Pull Fluorophores Based on Imidazole-4,5-dicarbonitrile: A Comparison of Spectral Properties in Solutionand Polymer Matrices, *Journal of Fluorescence*, 21 (4), 1779-1787, (**2011**).
23. **Danko M,** Libiszowski J, Wolszczak M, Racko D, Duda A, Fluorescence study of the dynamics of a star-shaped poly(epsilon-caprolactone)s in THF: A comparison with a star-shaped poly(L-lactide)s, ***Polymer*** **50 (10), 2209-2219 (2009).**
24. Hrdlovič P, Chmela S, Danko M, Sarakha, M., Guyot, Gh., Spectral properties of probes containing benzothioxanthene chromophore linked with hindered amine in solution and in polymer matrices: *Journal of Fluorescence* 18 (2), 393-402, (**2008**).
25. Kósa, Cs., Mosnáček, J., Bílešová, A., Kasák, P., Kronek, J., **Danko, M**., Kollár, J.: Synthesis and Photophysical Properties of Novel Derivatives of Acyclic Aromatic Amines. *Coll. Czech. Chem. Comm.* 72 (9), 1255 – 1268, (**2007**).
26. Matisová-Rychlá, J. Rychlý, **M. Danko**, Š. Chmela, P. Hrdlovič: On the Stabilizing Effect of Sterically Hindered Amines and Nitroxide Radicals in Thermal and Photo-oxidation of Polypropylene, 3rd European Weathering Symposium Natural and Artificial Ageing of Polymers, editor Thomas Reichert, Gesellschaft für Umweltsimulation GUS, CEEES Publication No 8, **2007**, p. 141.
27. **M. Danko**, Š. Chmela, P. Hrdlovič, "Synthesis, photochemical stability and photo-stabilizing efficiency of probes based on benzothioxanthene chromophore and hindered amine stabilizer", *Polymer Degradation and Stability*, 91 (**2006**), 1045-1051.
28. **M. Danko,** J. Libiszowski, T. Biela, M. Wolszczak, A. Duda: "Molecular Dynamics of Star-haped Poly(L-lactide)s in Tetrahydrofuran as Solvent Monitored by Fluorescence Spectroscopy", *Journal of Polymer Science, Polymer Chemistry*, **43** (**2005**), 4586-4599.
29. **M. Danko**, P. Hrdlovič, E. Borsig, "Monitoring of Swelling, of Interpenetrating Polymer Network of Polyethylene/Poly(styrene-co-butylmethacrylate) (PE/P(S-co-BMA) in Toluene and Cyclohexane Using Fluorescence Spectroscopy, *Polymer*, 44 (**2003**), 389-396.
30. **M. Danko**, Š. Chmela, P. Hrdlovič, "Photochemical stability and photostabilizing efficiency of anthracene/hindered amine stabilizer probes in polymer matrices", *Polymer Degradation and Stability*, 79 (2003), 333-343.
31. **M**. **Danko**, P. Hrdlovič, E. Borsig, „How information can render fluorescence spectroscopy about polymer structures?", *Chemicke Listy* 97 (2003), 1052-1060.
32. **M**. **Danko**, P. Hrdlovič, E. Borsig, "Characterisation of interpenetrating Polymer-like Network Based on Polyethylene/poly(Styrene-co-Butylmethacrylate) (PE/P(S-co-BMA) by Non-radiative Energy Transfer", *Journal of Photochemistry and Photobiology A.: Chemistry* 154 (2003), 279-288.
33. **M**. **Danko**, P. Hrdlovič, E. Borsig, "Quenching of pyrene fluorescence as a technique for characterization of swelling interpenetrating polymer network: polyethylene/poly(styrene-co-butylmethacrylate) (PE/P(S-co-BMA)." *European Polymer Journal* 39 (2003), 2175-2182.
34. P. Hrdlovič, **M. Danko**, S. Chmela, "Preparation and Spectral Characteristics of Anthracene-Hindered Amine Probes: Influence of the Medium", *Journal of Photochemistry and Photobiology A.: Chemistry*, 149 (2002), 207-216.
35. C. Kósa, **M. Danko**, A. Fiedlerová, P. Hrdlovič, E. Borsig, R. G. Weiss, „Pyrenyl Fluorescence as a Probe of Polymer Structure and Diffusion in a Polyethylene: Poly(butylmethacrylate)-co-polystyrene Interpenetrating Network and Related Polymers", *Macromolecules*, 34 (2001), 2673.
36. **M. Danko**, P. Hrdlovič, E. Borsig, „Spectral characteristic free and linked chromophores of pyrene type in solution and in simply and komplex polymer matrices (IPN)", *Journal of Macromolecular Science, A: Pure and Applied Chemistry,* A38 (2001), 467 - 486.
37. Š. Chmela, **M. Danko**, P. Hrdlovič, „Preparation, photochemical stability and photostabilizing efficiency of adducts of 1,8-naphtaleneimide and hindered amine stabilizers in polymer matrices", *Polymer Degradation and Stability*, **63** (1999), 159.
38. P. Hrdlovič, Š. Chmela, **M. Danko**, „Spectral characteristic and photochemical stability of fluorescent probes on 1,8-naphthaleneimide in solution and in polymer matrix", *Journal of Photochemistry and Photobiology A.: Chemistry*, 112 (1998), 197.

Conference contributions:

More than 50 contributions on national and international conferences, workshops and meetings.