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SYNTHESIS AND EVALUATION OF NEW RADICAL PHOTOINITIATORS BEARING THE ALKOXYSILANE FUNCTIONALITY

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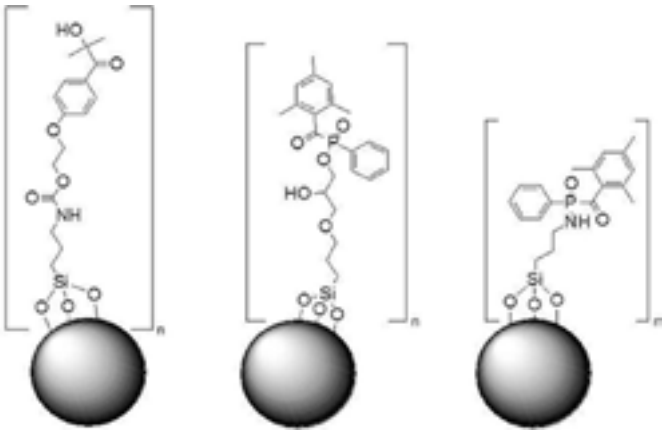
Photoinitiators, which can be readily immobilized on surfaces via silanization, have gained considerable attention of both scientists and engineers. One of the reasons for this interest is that immobilized initiators lead to a covalent linkage between the surface and the resulting polymer chain. Thus, immobilized photoinitiators are expected not to migrate out of the polymer network, which reduces potential health risks. The synthesis of a range of short- and long-wavelength absorbing photoinitiators bearing alkoxysilyl groups will be presented. In all cases, the synthesis starts from commercially available products, Irgacure 2959 or Irgacure TPO-L, and takes 1–4 steps. Both free and immobilized initiators are characterized and tested with regard to their efficiency in acrylic and thiol-ene systems. The findings confirm the good applicability of the nanoparticle-immobilized photoinitiators in the preparation of nanocomposite materials.



Recent Publications

1. L. Hu, W. Shi (2011) UV-Irradiation Cured Organic-inorganic Hybrid Nanocomposite Initiated by Ethoxysilane-modified Multifunctional Polymeric Photoinitiator through Sol-gel Process, Chin. J. Chem. 29 (9), 1961;
2. A. Huber, A. Kuschel, T. Ott, G. Santiso-Quinones, D. Stein, J. Bräuer, R. Kissner, F. Krumeich, H. Schönberg, J. Levalois-Grützmacher, H. Grützmacher (2012) Phosphorous-Functionalized Bis(acyl)phosphane Oxides for Surface Modification, Angew. Chem. Int. Ed. 51 (19), 4648;
3. M. Sahin, S. Schlögl, S. Kaiser, W. Kern, J. Wang, H. Grützmacher (2017) Efficient initiation of radical-mediated thiol-ene chemistry with photoactive silica particles, J. Polym. Sci. Part A Polym. Chem., 55 (5), 894;
4. P. Roszkowski, M. Sahin, S. Ayalur-Karunakaran, Ch. Gammer, S. Schlögl, W. Kern, K.K. Krawczyk (2017) Synthesis and evaluation of new radical photoinitiators bearing trialkoxysilyl groups for surface immobilization, Polymer, 129, 207;
5. M. Sahin, K.K. Krawczyk, P. Roszkowski, J. Wang, B. Kaynak, W. Kern, S. Schlögl, H. Grützmacher (2018) Photoactive silica nanoparticles: Influence of surface functionalization on migration and kinetics of radical-induced photopolymerization reactions, Eur. *Polym. J.*, 98, 430.

Biography

Dr. Krzysztof K. Krawczyk was born in Częstochowa, Poland in 1983. He received a MSc in Environmental Studies and a PhD in Chemical Sciences at the University of Warsaw (Poland), both under the supervision of prof. dr. Zbigniew Czarnocki (Laboratory of Natural Products Chemistry). In 2011 he was guest researcher at the Centre National de Recherche Scientifique in Caen (France) working on chemically robust magnetic core-shell nanoparticles with prof. dr. Bernhard Witulski. In 2012 he received the "Kolumb" fellowship of the Foundation for Polish Science to work at the University of Groningen (The Netherlands) in the group of prof. dr. Ben L. Feringa (Nobel Laureate in Chemistry 2016). In 2015 Krzysztof moved to the Montanuniversitaet Leoben (Austria) where he is currently working at the Department of Polymer Engineering and Science. His research interests range from photochemistry, including photoinitiators and molecular switches, to the design of new nanostructured composites and conductive inks for printed electronics.

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