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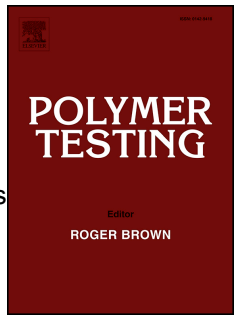

Photopolymerization of hybrid monomers, part I: Comparison of the performance of selected photoinitiators in cationic and free-radical polymerization of hybrid monomers

Damian Nowak, Joanna Ortyl, Iwona Kamińska-Borek, Katarzyna Kukuła, Monika Topa, Roman Popielarz

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Material Performance

Photopolymerization of Hybrid Monomers, Part I: Comparison of the Performance of Selected Photoinitiators In Cationic and Free-Radical Polymerization of Hybrid Monomers.

Damian Nowak[3], Joanna Ortyl[1,2], Iwona Kamińska-Borek[1], Katarzyna Kukuła[1], Monika Topa[1], Roman Popielarz[1]*

[1] Cracow University of Technology, Faculty of Chemical Engineering and Technology, Warszawska 24, 31-155 Kraków, Poland

[2] Photo HiTech Ltd., Bobrzyńskiego 14, 30-348 Kraków, Poland

[3] Synthos S.A., Chemików 1, 32-600 Oświęcim, Poland

ABSTRACT

Photopolymerization of the hybrid monomers: 3,4-epoxycyclohexylmethyl methacrylate (Cyclomer M100) and 2-(2-vinyloxyethoxy)ethyl acrylate (VEEA) was studied by Fluorescence Probe Technique (FPT). Kinetics of cationic and free-radical photopolymerization of the hybrid monomers in the presence of the same molar concentration of various photoinitiators was compared, using UV LEDs as the curing light source. The performance of the following photoinitiators was tested in the cationic photopolymerization: Sylanto 7M-S, Sylanto 7M-P, Speedcure 938, Irgacure 250, HIP, Esacure 1187, and the following photoinitiators were used to induce free radical photopolymerization: Irgacure 184, Irgacure 127, Irgacure 651, Irgacure 907, Irgacure 819 and Speedcure TPO. It was found that, among the cationic photoinitiators, Sylanto 7M-S and Sylanto 7M-P are the most effective photoinitiators of the cationic polymerization for use with 320 nm and 365 nm UV LEDs, while Irgacure 819 and Speedcure TPO perform best in free radical photopolymerization of the hybrid monomers. Some structural factors and parameters affecting the photoinitiators performance are discussed.

Keywords: photopolymerization, hybrid monomers, cationic polymerization, free radical polymerization, FPT, photoinitators

*Corresponding author:
E-mail: rpopiel@chemia.pk.edu.pl (Roman Popielarz)