

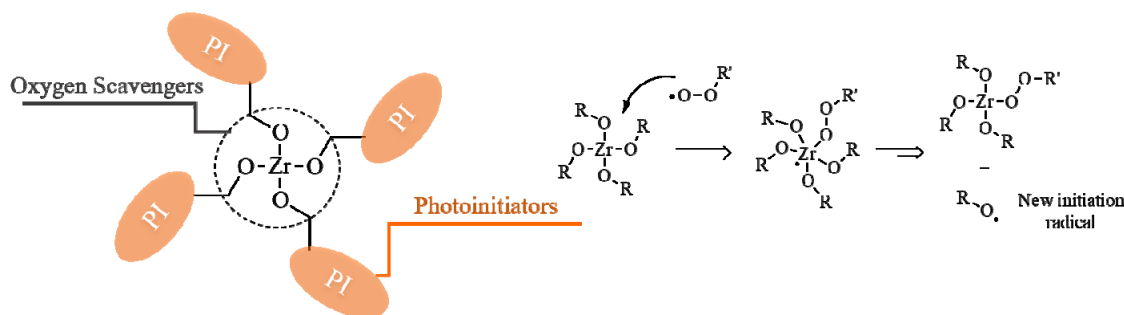
ORGANOZIRCONIUM MULTIFUNCTIONAL PHOTOINITIATORS FOR MITIGATING OXYGEN INHIBITION AND MIGRATION

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In this study, a new type of organozirconium photoinitiator was prepared by the ligand substitution of organic zirconium compounds in the absence of any catalyst. The synthesized multifunctional photoinitiators (MPIs) were characterized in terms of UV absorption properties and photoinitiation ability. The absorption bands of the MPIs are similar to their low-molecular-weight counterpart. These photoinitiators were used for the curing of a mixture of bisphenol A diacrylate and hexanedioldiacrylate. The kinetics of photopolymerization of the formulations was monitored by real-time FTIR spectroscopy, under the irradiation of a mercury-xenon lamp. Organozirconium complexes are known to tap the potential of overcoming the oxygen inhibition [1], thus the depth conversion profiles of the UV-cured films were followed by confocal Raman microscopy. Furthermore, the migration of residual photoinitiator was investigated via solvent extraction from the UV-cured film, the solution of which being measured by UV-vis spectroscopy. The MPIs have comparative efficiency on photoinitiation of the formulation and varied properties on mitigating oxygen inhibition and migration [2,3].



[1] Zhou, J.; Allonas, X.; Ibrahim, A.; Liu, X. Prog. Polym. Sci., 2019, 99:101165.

[2] Zhou, J.; Allonas, X.; Liu, X. ChemPhotoChem, 2018, 2(1): 18.

[3] Zhou, J.; Allonas, X.; Liu, X. J. Photochem. Photobiol. A, 2018, 356: 580.