

THE USE OF NEW THREE-COMPONENT PHOTOINITIATORS ACTIVATED BY UV-VIS LIGHT WITH TRIS(TRIMETHYLSILYL)SILANE IN THE ACRYLATE POLYMERIZATION PROCESS

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The process of light-induced polymerization has become the object of interest of scientists in recent years due to the many advantages of its use. The photopolymerization reactions are environmentally friendly, economical, energy saving, highly efficient and solvent free [1]. This advanced technique has found great application in the production of innovative adhesives, photo-curable coatings, varnishes, dental composites and many others [2,3].

The aim of this study was to apply new three-component initiating systems for photopolymerization of 2-ethyl-2-(hydroxymethyl)-1,3-propanediol triacrylate (TMPTA) in blue-light region and to evaluate their effectiveness. The obtained results were compared with the two-component systems. 1,3-Bis(phenylamino)squaraine (SQG1) with various co-initiators were used as effective UV-Vis light photoinitiators. As co-initiators we used the following compounds: silane (TTMSS), borate salt (B2), carbazole (NVC) and different iodonium salts (I1, I2, I77, I81), which are the sources of active radicals initiating TMPTA polymerization.

The photopolymerization experiments were carried out by the use of a Differential Scanning Calorimeter TA DSC Q2000 Instrument and a TA Q PCA camera equipped with a high-pressure mercury lamp (Photo-DSC). The measurements were made in isothermal conditions at a temperature of 25°C with a nitrogen flow of 50 mL min⁻¹. The light source was UV-Vis radiation (300-500 nm) with a constant intensity equal to 30 mW cm⁻².

Results of these studies, as well as other experimental observations, will be presented.

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[3] J. Kirschner, J. Paillard, B. Graff, J. M. Becht, J. E. Klee and J. Lalevée, *Macromol. Chem. Phys.*, 2020, **221**, 1900495.