

NEW NAPHTHALENE IMIDE BASED INITIATORS FOR PHOTO-ATRP

Mária Gurská,^{1,*} Anita Eckstein¹, Jaroslav Mosnáček^{1,2}

¹Polymer Institute SAS, Dúbravská cesta 9, 845 41, Bratislava, Slovakia

²CEMEA SAS, Dúbravská cesta 9, 84511, Bratislava, Slovakia

Naphthaleneimide (NI) derivatives represent a class of organic compounds with diverse applications, ranging from materials science to medicinal chemistry.[1] They can be incorporated into polymers, supramolecular assemblies, and coordination complexes to impart desired properties such as enhanced stability, fluorescence, or conductivity.[2] Therefore, two naphthalenimide derivatives were proposed in the form of alkyl bromide initiators, serving as potential initiators for photochemically induced atom transfer radical polymerization (photo-ATRP).[3] Third acetylated naphthalene imide was chosen as a probe to investigate the potential effect of its presence on polymerization and to elucidate the mechanisms involved. These NI compounds should not affect the polymerization mechanism itself since they absorb a different wavelength of light than that required for polymerization. They should serve as fluorescent markers at the beginning of the polymer chain, for studying the mechanism of photo-ATRP in terms of initiation efficiency. Therefore, they provide a more sensitive system to study the initiation efficiency and viability of photo-ATRP through a combination of GPC and fluorescence detectors. In the case of light absorption used in photo-ATRP, a photoactive initiator can increase the initiation efficiency by absorbing light and converting it to energy in the initiation phase of polymerization. Furthermore, they confirm the feasibility of preparing fluorescent materials one step photopolymerization. Conversely, when using an initiator lacking a fluorescent label, additional modification becomes necessary. The named initiators were prepared, characterized, and applied for the first time in photoATRP during the polymerization of methyl methacrylate, and methyl/*n*-butyl acrylate in various solvents in the presence of air, with subsequent monitoring of the fluorescence label in the polymers. The living end of the polymer was also confirmed by the preparation of short oligomers as macroinitiators, which were subsequently subjected to elongation reactions.

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References

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