A NOVEL VISIBLE LIGHT INDUCED CATIONIC POLYMERIZATION METHOD BASED ON ELECTROPHILIC AROMATIC SUBSTITUTION REACTIONS

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A novel visible light induced cationic polymerization method to obtain polyphenylenemethylene(PPM) derivatives was studied. Reaction kinetics and behavior of different nucleophiles namely, methoxybenzene (MB), dimethoxybenzene (DMB) and dihydroxybenzene(DHB) was investigated. In recent years, our laboratory group successfully synthesized different kinds of polycondensates with visible light induced polymerization [1-3]. In this work, PPM derivatives were synthesized by electrophilic aromatic substitution reaction between xylenium cation that is generated by manganesedecacarbonyl-diphenyliodonium salt combination and DMB. α,α′-dibromo-p-xylene was used to generate xylenium cations as electrophile. PPM derivatives exhibit photoluminescence around 400 to 600 nm, their high decomposition temperature and resistance to oxidants leads high feasibility in fields of corrosion resisting coatings and optical fibers [4]. Synthesized PPM's were used to obtain high molecular weight block copolymers with methyl methacrylate (MMA) and cyclohexeneoxide (CHO) by visible light induced free-radical and free-radical promoted cationic polymerizations respectively. Highly fluorescent fibers of synthesized block copolymers were obtained by electrospinning method.

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