New Synthetic Methods for Telechelic Functionalized Polystyrene

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ABSTRACT

Recently there has been increased interest in finding new and improved methods to prepare telechelic polymers, a sub-genre of polymers containing two functional end groups. Synthetic methods of telechellic polymers may also apply to the synthesis of more sophisticated polymeric architectures. In this research, telechellic functionalized polystyrene have been prepared with a recently developed strategy through an atom transfer radical polymerization (ATRP)-mediated end-capping reaction of a difunctionalized polystyrene and a sterically hindered monomer that can add only once. Sterically hindered phenyl ester monomers were prepared via Steglich esterification between 2-phenylacrylic acid and an alcohols containing the desired functionalities. Bis-bromoisobutyryloxyethane (BBOE) was used to initiate difunctional polymerization via ATRP using 1,2 in the presence of Cu(I) complexes. Subsequent ATRP-mediated end-capping (addition) of functionalized 2-phenylacrylate derivatives allowed for unique photochemical, mechanical and other properties of the corresponding polymeric materials. Future work can allow for unique chemical, photochemical, mechanical and other properties of the telechelic polymers with various functionalities to explore the different properties.

REFERENCES

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