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KEYWORDS : BLOCK COPOLYMER, SAMARIUM IODIDE, THF, STYRENE, BUTYL ACRYLATE

PANNEE SRIBUATHONG: SYNTHESIS OF BLOCK COPOLYMERS USING SAMARIUM IODIDE AS A POLARITY INVERTER. THESIS ADVISORS: PRANEE PHINYOCHEEP, Doctorat de l' Universite' du Maine, TAWEECHAI AMORNSAKCHAI, Ph.D., JITLADDA SAKDAPIPANICH, Ph.D., 132 p. ISBN 974-664-741-5

In this work, utilisation of site transformation technique of cationic living end into the anionic one using SmI_2/HMPA system has been studied for the preparation of diblock and triblock copolymers based on three types of monomers; tetrahydrofuran(THF), butyl acrylate (BuA) and styrene/(S). To yield polytetrahydrofuran (PTHF), living cationic polymerisation was prepared by methyl triflate initiator at room temperature. It was found that, M_n of PTHF increased with increasing the polymerisation time. Then, the reduction efficiency of the cationic end into the anionic end caused by SmI_2/HMPA system was investigated. The results showed that the reduction was completely achieved within 30 min. at the mole ratio of $\text{HMPA}/\text{SmI}_2 = 1:5$. For the preparation of poly(THF-b-BuA)s, various polymerisation parameters such as SmI_2/I ratio, the quantities and polymerisation time of BuA part and HCl/I ratio were investigated. It was found that the block copolymer could be successfully prepared using SmI_2/I equal to 2. Increasing polymerisation time resulted in an increased M_n and MWD broadening. However, low % conversion was obtained which may be due to the premature termination caused by the reaction of the transformed macroanion with the ester function. The HCl/I ratio was found to play an important role on the M_n of the resulting polymers. Increasing the ratio of HCl/I resulted in lower M_n of the copolymer. This may be due to the depolymerisation occurred through hydrolysis of the butyl acrylate moiety. It was found in the case of poly(THF-b-S)s that lower M_n of poly(THF-b-S) was obtained, as compared to the poly(THF-b-BuA) at similar conditions. As similar trend was found in the preparation of triblock copolymer of THF, S and BuA.