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Full Papers

_N_-Chlorosuccinimide(NCS):A Novel Initiator for Atom Transfer Radical Polymerization of Methyl Methacrylate

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摘要 以*N*-氯代丁二酰亚胺(NCS)为引发剂，分别与CuCl/PMDETA (*N*, *N*,

N’, *N*’, *N*’ ’-pentamethyldiethylenetriamine), CuCl/MA_5-DETA

(*N*, *N*, *N*’, *N*’, *N*’ ’-penta (methyl acrylate) diethylenetriamine)

，CuCl/bipy (2,

2’-bipyridyl)催化体系进行了甲基丙烯酸甲酯的原子转移自由基聚合。由动力学半对数曲线ln ($[M]_0/[M]_t$)－时间近似呈线性关系，聚合物分子量随单体转化率线性增长，表明了体系具有典型的活性自由基聚合的特征。由^{1}H NMR核磁端基分析证明了*N*-氯代丁二酰亚胺可以作为原子转移自由基聚合的引发剂。与*N*-溴代丁二酰亚胺(NBS)相比，*N*-氯代丁二酰亚胺作为甲基丙烯酸甲酯的原子转移自由基聚合的引发剂时，聚合速率慢，但所得聚合物的分子量分布窄。

关键词 原子转移自由基聚合,引发剂,甲基丙烯酸甲酯,*N*-氯代丁二酰亚胺

分类号

***N*-Chlorosuccinimide (NCS): A Novel Initiator for Atom Transfer Radical Polymerization of Methyl Methacrylate**†

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Abstract Atom transfer radical polymerization (ATRP) of methyl methacrylate (MMA) was achieved, using *N*-chlorosuccinimide (NCS) as an initiator together with catalytic system CuCl/PMDETA (*N*,*N*,*N*′,*N*′,*N*″-pentamethyldiethylenetriamine), CuCl/MA_5-DETA (*N*,*N*,*N*′,*N*′,*N*″-penta(methylacrylate)diethylenetriamine), and CuCl/bipy (bipy＝2,2'-bipyridyl) respectively. The results indicated that the polymerization possessed typical controlled/living radical polymerization characteristics. The analysis for terminal group of obtained polymer by ^{1}H NMR proved that NCS is an initiator for ATRP. In comparison with NBS, the polymerization rate was slower and the resulted polymer had narrower molecular weight distribution (MWD) when NCS was employed as the initiator.

Key words atom transfer radical polymerization initiator methyl methacrylate *N*-chlorosuccinimide

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