

梳型接枝共聚物的合成(IV)-氯乙酸降冰片烯甲酯引发苯乙烯、甲基丙烯酸甲酯原子转移自由基聚合的研究

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摘要 首次报道以自制氯乙酸降冰片烯甲酯(NMCA)为引发剂的苯乙烯、甲基丙烯酸甲酯的原子转移自由基(ATRP)本体聚合。详细考察了单体转化与反应时间、产物分子量及分子量分布间的关系。研究发现,此引发引发甲基丙烯酸甲酯ATRP反应所得聚合物的分子量分布较宽(PDI=1.80~2.45),且实测值(GPC)与理论值偏差较大。而NMCA引发的苯乙烯的ATRP反应可得分子量分布较窄(PDI=1.54)、实验值(GPC)与理论值基本吻合的产物。单体转化率随反应时间的变化及产物分子量随单体转化率变化研究证明这一聚合反应具有活性聚合反应特征。产物的NMR分析证明所合成产物分子中降冰片烯环上双键未参与聚合反应。

关键词 [自由基聚合](#) [苯乙烯](#) [甲基丙烯酸甲酯](#) [核磁共振谱法](#)

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Atom Transfer Radical Polymerization of Styrene and Methyl Methacrylate Initiated by 5-Norborn-2-enyl Methyl Chloroacetate

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Abstract Atom transfer radical polymerization (ATRP) of styrene (S) and methyl methacrylate (MMA) initiated by 5-norborn-2-enyl methyl chloroacetate (NMCA) is reported for the first time. The variation of monomer conversion with reaction time and that of molecular weight with monomer conversion were investigated in detail. Experimental results show that the molecular weight distribution (MWD) of the product of ATRP of MMA initiated by NMCA is pretty broad (PDI = 1.80 ~ 2.45) and the deviation of the value of MW detected (GPC) from that of the calculated is pretty large. While ATRP of styrene showing the characteristics of living polymerization, the MWD of the product is narrow (PDI = 1.54), the value of MW detected is in good accordance with that of the calculated, both the variation of monomer conversion with time and MW of the polymer with monomer conversion show a linear relationship. NMR characterization of the synthesized products shows that the double bond in the norbornene ring of the product polymers is not affected by the ATRP conducted.

Key words [FREE RADICAL POLYMERIZATION](#) [STYRENE](#) [METHYLMETHACRYLATE](#) [NMR SPECTROMETRY](#)

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