

FULL PAPERS

新型取代硅桥联茂稀土化合物的合成及在纳米级氢化钠助催化剂作用下高活性催化甲基丙烯酸甲酯聚合的研究

谢小敏, 黄吉玲*

华东理工大学金属有机实验室, 上海 200237

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摘要 本文合成了4个新型侧链含芳基取代硅桥联茂稀土氯化物, 根据IR、MS和元素分析的数据推测它们为非溶剂化的二聚体结构。在助催化剂AlEt₃或NaH的存在下, 这些侧链含芳基取代硅桥联茂稀土氯化物可以催化甲基丙烯酸甲酯的聚合。当纳米级NaH作为助催化剂时这类化合物可以高效地催化MMA聚合, 其活性可达到茂稀土氯化物作为单组分催化剂时的活性。在0℃下, 1小时内, [Me₂Si(C₅H₃CMe₂C₆H₅)₂LnCl]₂/NaH(nanometric)催化MMA聚合得到聚合物的产率大于80%, 并且粘均分子量高于10⁵, 但该催化体系得到聚合物的等规度较低。图1表3参28

关键词 [硅桥联茂稀土化合物](#), [纳米级氢化钠](#), [聚合反应](#), [甲基丙烯酸甲酯](#)

分类号

Synthesis of New Silicon-linked Lanthanocene Complexes and Their High Catalytic

XIE Xiao-Minkk, HUANG Ji-Ling*

Laboratory of Organometallic Chemistry, East China University of Science and Technology, Shanghai 200237, China

Abstract The synthesis and characterization of four new silicon-linked lanthanocene complexes with pendant phenyl groups on cyclopentadiene were reported. Based on the data of elemental analyses, MS and IR, the complexes were presumed to be unsolvated and dimeric complexes [Me₂Si(C₅H₃CMe₂C₆H₅)₂LnCl]₂ [Ln=Er (1), Gd (2), Sm (3), Dy (4)]. In conjunction with AlEt₃ or sodium hydride as the co-catalyst, these complexes could efficiently catalyze the polymerization of methyl methacrylate (MMA). When the nanometric sodium hydride was used as a co-catalyst, the complexes were highly effective for the polymerization of MMA. At low temperature and in short time, in [Me₂Si(C₅H₃CMe₂C₆H₅)₂LnCl]₂/NaH (nanometric) system, the polymer was obtained in more than 80% yield and the molecular weight was greater than 10⁵. The activity reached that of organolanthanide hydride as a single-component catalyst. In [Me₂Si(C₅H₃CMe₂C₆H₅)₂ErCl]₂/NaH (nanometric) system, the effects of the molar ratio of MMA/catalyst and catalyst/co-catalyst, and the temperature on polymerization were studied.

Key words [silicon-linked lanthanocene](#), [nanometric sodium hydride](#), [polymerization](#), [methyl methacrylate](#)

DOI:

通讯作者 黄吉玲 qianling@online.sh.cn

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