

论文

双吡啶亚胺镍/甲基铝氧烷催化降冰片烯的聚合

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摘要:

合成了两种双吡啶亚胺镍配合物: 双-*N*-(苯基-1-3,5-二甲基吡啶基亚甲基)苯基亚胺二溴化镍(Cat. 1)和双-4-甲氧基-*N*-(苯基-1-3,5-二甲基吡啶基亚甲基)苯基亚胺二溴化镍(Cat. 2). 研究了Cat. 1/MAO和Cat. 2/MAO催化体系对降冰片烯(NBE)单体聚合的催化性能, 考察了各种聚合条件, 如温度、Al/Ni摩尔比及催化剂浓度对降冰片烯的催化效率、单体转化率、聚合物分子量及分子量分布的影响. 研究表明, Cat. 1/MAO和Cat. 2/MAO催化体系对降冰片烯聚合具有较高的催化效率, 可达到 10^5 g PNBE/(mol Ni)数量级, 所得聚降冰片烯(PNBE)的重均分子量在 10^5 以上, 分子量分布指数在2左右. 聚合产物的 ^1H NMR和FTIR谱分析结果表明, 该聚合反应是以单体的乙烯基加成聚合机理进行的.

关键词: 双吡啶亚胺镍配合物 聚降冰片烯聚合 乙烯基加成聚合

Norbornene Polymerization Catalyzed by Bispyrazolylimineylimine Nickel(II)/MAO Catalytic Systems

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Abstract:

Two bispyrazolylimine nickel complexes[bis-*N*-(phenyl-1,3,5-dimethylpyrazolylmethylene)phenylimine nickel dibromide] (Cat. 1) and [bis-4-methoxy-*N*-(phenyl-1,3,5-dimethylpyrazolylmethylene) phenylimine nickel dibromide](Cat.2) were synthesized. Norbornene polymerization catalyzed by Cat. 1/MAO and Cat. 2/MAO systems was investigated. The catalytic efficiency, molecular weight and molecular weight distribution were influenced by the polymerization conditions, such as the polymerization temperature, Al/Ni molar ratio and catalyst concentration. The results show that Cat. 1/MAO and Cat. 2/MAO systems displayed a high catalytic efficiency with 10^5 g PNBE/(mol Ni) magnitude order. The molecular weights of PNBE were higher than 10^5 and the molecular weight distributions were around 2. According to ^1H NMR and the FTIR spectra, the mechanism of the norbornene polymerization is vinyl-addition type polymerization.

Keywords: Bispyrazolylimine nickel complexes Norbornene polymerization Vinyl-addition type polymerization

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