

研究快报

β -二酮锆/AIEt₂Cl/MAO催化乙烯原位共聚合成支化聚乙烯

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收稿日期 2007-11-9 修回日期 网络版发布日期 2008-2-27 接受日期

摘要 以 β -二酮锆为唯一主催化剂, 以AIEt₂Cl和MAO为助催化剂, 使之分别与主催化剂作用形成两种不同功能的催化活性中心, 考察乙烯原位共聚合成支化聚乙烯。

关键词 [乙炔原位共聚](#) [支化聚乙烯](#) [\$\beta\$ -二酮锆配合物](#) [一氯二乙基铝](#) [甲基铝氧烷](#)

分类号 [O631](#)

DOI:

Synthesis of Branched Polyethylene from Ethylene *via in situ* Copolymerization Catalyzed by β -Diketonate Zirconium/AIEt₂Cl/MAO

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Received 2007-11-9 Revised Online 2008-2-27 Accepted

Abstract A novel catalytic system to prepare branched polyethylene with single catalyst activated by two different co-catalysts is reported in this paper *via* the tandem catalysis, with ethylene as single monomer. Such catalytic system is composed of β -diketonate zirconium complexes, *i.e.* (acac)₂ZrCl₂ (I) and (dbm)₂ZrCl₂ (II) as catalyst precursors, diethylaluminium chloride(AIEt₂Cl) as a co-catalyst for ethylene oligomerization and methylaluminoxane(MAO) as another one for the *in situ* copolymerization with ethylene. The oligomers obtained were mainly α -olefins, and the contents of them in weight were 76.84% for I and 65.99% for II, while the part being able to be copolymerized was 62.12% and 55.32% for I and II, respectively. The branched polyethylene *via in situ* copolymerization of ethylene was prepared by the tandem catalytic system I/AIEt₂Cl/MAO or II/AIEt₂Cl/MAO. ¹³C NMR spectrum reveals that the resultant copolymer was branched polyethylene with total branches of 2.1/1000C, including ethyl group of 1.2/1000C, butyl group of 0.8/1000C and longer branches of 0.1/1000C. With increasing the molar ratio of AIEt₂Cl to MAO, the melting temperature of the polymer obtained decreased from 133.7 to 116.7 °C for I/AIEt₂Cl/MAO and from 131.7 to 118.8 °C for II/AIEt₂Cl/MAO as well as the change of crystallinity. The catalytic activities for catalyst I/AIEt₂Cl/MAO and II/AIEt₂Cl/MAO were from 2.48×10⁴ to 0.10×10⁴ g PE/(mol Zr·h) and from 1.00×10⁴ to 0.32×10⁴ g PE/(mol Zr·h), respectively. The results indicate that the branched polyethylene can be obtained by such a catalytic system.

Key words [In situ copolymerization of ethylene](#); [Branched polyethylene](#); [\$\beta\$ -Diketonate zirconium complex](#); [Diethylaluminium chloride](#); [Methylaluminoxane](#)

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