

论文

甲基丙烯酸十二酯基二元共聚制备缔合减阻剂的合成与性能研究

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摘要:

在石油管道运输中应用最广泛的减阻剂是直链共聚烯烃类聚合物,但其极易因分子链的断裂而使其分子量降低,以至失去减阻功能,即通常所说的剪切降解.本文主要合成一种新型抗剪切减阻剂,并对其合成方法、引发剂对聚合单体转化率的影响、缔合减阻剂减阻率及抗剪切性能的比较等进行了实验研究.研究表明:该合成反应温和同时反应过程易控制;其抗剪切降解性能好于直链共聚烯烃类高分子减阻聚合物;聚合物的减阻率随添加剂浓度的增加而增加,但呈现上升变缓的趋势.同时随着添加剂浓度的增加,剪切后添加剂与未剪切添加剂减阻率变化曲线呈现出吻合的趋势.

关键词: 减阻剂;分子缔合;乳液聚合;抗剪切

Synthesis and properties of associating DRA by binary copolymerization based on lauryl methacrylate

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Abstract:

The linear chain copolymerized alkenes polymer is widely used as a drag reducing agent (DRA) in oil pipeline transportation. However, the molecular weight of the drag reducing agent decreased sharply because of chain fracture, and the decreased effectiveness of drag reducing, known as shear degradation. A new kind of anti shearing drag reducing agent was synthesized. The synthesis method, effect of initiator on the monomer onversion, drag reducing rate of associating DRA and anti shearing performance were examined. The result showed that the synthesis process had the advantages of simple operation and mild reaction conditions. The synthesized DRA showed better anti shearing performance than linear chain copolymerized alkenes DRA. The drag reducing efficiency increased with adding the synthesized DRA and the increasing trend became slower. With concentration increasing, drag reducing efficiency curve of the sheared additives became similar to the unsheared one.

Keywords: drag reduction agent; molecular associating; emulsion polymerization; antishearing

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