

题 目 低分子量 SMA 树脂的单酯化

摘要

苯乙烯-马来酸酐共聚物是一种反应活性很强的聚合物,可以与很多物质发生改性反应,扩大其应用范围。本论文是采用溶液聚合的方法,以对甲苯磺酸为催化剂,甲苯为带水剂(40%),环己酮为溶剂(60%),并使用正丁醇作为酯化剂对低分子量 SMA 进行酯化改性。研究了催化剂用量,反应温度以及反应时间对 SMA 酯化物(SME)酯化率的影响。

通过红外表征分析证明了以溶液聚合的方法在上述条件下可以对 SMA 进行酯化改性,合成 SME。通过对 SMA 与 SME 的酸值测定及计算分析可得如下结果: 1.SME 的酯化率随着催化剂用量的增加而提高,当用量达到 3%后 SME 的酯化率趋于稳定不再有显著提高。2.SME 的酯化率随着反应温度的上升而提高,当温度达到 130 °C后 SME 的酯化率开始降低。3.SME 的酯化率随着反应时间的增加而提高,当反应时间达到 4 小时后 SME 的酯化率趋于稳定几乎不再提高。4.SME 的酯化率随着反应时间的增加而提高,当反应时间达到 4 小时后 SME 的酯化率趋于稳定几乎不再提高。反应温度 120°C,溶剂含量 60%,SMA 与正丁醇的单体配比 1:4,带水剂用量 40%,催化剂用量为 3%以及反应时间 6 小时。得到的最高酯化率为 45.71%。

关键词: 苯乙烯-马来酸酐共聚物 酯化率 催化剂 反应温度 反应时间

Esterification Modification of low Molecular weight Styrene-Maleanhydride Copolymer

ABSTRACT

Styrene-maleic anhydride copolymer is a kind of polymer with strong reaction activity, which can react with many substances and increase its application range. In this paper, p-toluene sulfonic acid was used as catalyst, toluene as water carrying agent (40%) and cyclohexanone as solvent (60%). N-butanol was used as esterification agent to esterify low molecular weight SMA. The effects of catalyst dosage, reaction temperature and reaction time on the esterification rate of SMA esterification (SME) were studied.

Through infrared characterization analysis, it is proved that SMA can be esterified and modified by solution polymerization under the above conditions, and SME. can be synthesized by esterification. Through the determination and calculation and analysis of the acid values of SMA and SME, the following results can be obtained: 1.SME increased with the increase of catalyst dosage. When the amount of catalyst reached 3%, the esterification rate of SME tended to be stable and no longer significantly increased. 2.The esterification rate of SME increased with the increase of reaction temperature, and the esterification rate of sme began to decrease when the temperature reached 130 °C. 3.The esterification rate of SME increased with the increase of reaction time. When the reaction time reached 4 hours, the esterification rate of sme tended to be stable and almost no longer increased. 4.The esterification rate of sme increased with the increase of reaction time. When the reaction time reached 4 hours, the esterification rate of sme tended to be stable and almost no longer increased. The reaction temperature is 120 °C, the solvent content is 60%, the monomer ratio of Ma to n-butanol is $1 \leq 4$, the amount of water carrying agent is 40%, the amount of catalyst is 3% and the reaction time is 6 hours. The highest

esterification rate was 45.71%.

**Key words: SMA esterification rate catalytic agent reaction temperature
reaction time**

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