材料科学与工程

种子乳液聚合制备MCPU-PMMA复合乳液

鲍利红[1]；兰云军[2];张淑芬

大连理工大学精细化工国家重点实验室;温州大学浙江省皮革工程重点实验室

摘要　　本文采用改性蓖麻油合成了软段中含不饱和双键的阴离子聚氨酯水分散液（MCPU），将其作为可聚合乳化剂和种子成分同甲基丙烯酸甲酯（MMA）进行共聚，制得了MCPU－PMMA复合乳液。1HNMR谱图显示MCPU中含有双键结构, 共聚后双键消失。通过考察单体转化率和复合乳液平均粒径、凝胶量及成膜耐水及甲苯性探讨了影响种子乳液聚合的多种因素：采用过硫酸钾作为引发剂，单体转化率高，乳液粒径小，成膜耐水及甲苯性好；反应的表观活化能Ea为164.86kJ/mol，反应温度控制在70℃较适宜；聚合反应速率Rp∝［I］1.0856，引发剂用量宜控制在聚合有效组份总质量的0.5%。

关键词　　MCPU-PMMA复合乳液；种子乳液聚合；转化率；合成

分类号

Synthesis of MCPU-PMMA hybrid emulsion through seeded emulsion polymerization

Abstract

A kind of anionic micro-cellular polyurethane (MCPU)dispersion containing unsaturated double bonds in the soft segments was synthesized with modified castor oil, and it was used as polymerizable emulsifier and seed composition for emulsion copolymerization of MCPU and methyl methacrylate (MMA).1H NMR spectrum showed that double bonds existing in MCPU disappeared after it was copolymerized with MMA.Various factors that affect the seeded emulsion copolymerization were investigated through measuring the conversion of monomers, average particle size and amount of agglomeration, water and toluene resistance of the film.The results showed that when taking potassium persulfate as initiator, the emulsion copolymerization had higher conversion, the average particle size was smaller and the film had better water and toluene resistance.It was proper to keep the reaction temperature at 70℃.The activation energy of the copolymerization was 164.86 kJ·mol-1.Copolymerization rate Rp∝［I］1.0856,and the dosage of initiator should be 0.5% of the total polymerizable composition.

Key words　MCPU-PMMA hybrid emulsion　seeded emulsion polymerization　conversion　synthesis

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通讯作者　兰云军 blh332@163.com

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- 兰云军
- 张淑芬