

论文

反应性复合乳液的合成、表征及其交联反应

张继德, 杨慕杰, 杨欢, 朱杨荣

浙江大学高分子科学与工程系; 浙江大学高分子科学与工程系 杭州

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摘要 利用种子半连续乳液聚合方法合成了核层或壳层带有环氧基以及壳层带有羧基的3种不同核/壳结构的乳胶粒子, 通过物理共混带环氧基和羧基的乳胶粒子, 得到了两种反应性复合乳液. 利用透射电镜和激光动态光散射对乳胶粒子进行了表征, 其粒径分布较窄, 粒径分布的多分散系数为0.062, 平均粒径约76 nm, 乳胶粒子具有明显的核/壳结构. 通过胶膜的凝胶率和膨胀率的测定和红外光谱分析对反应性复合乳液中乳胶粒子的扩散及交联反应进行了研究, 并探讨了不同核壳结构复合乳液对涂膜机械性能的影响. 研究表明, 当反应性复合乳液中的环氧基和羧基分别分布在乳胶粒子的核层和壳层时, 有利于聚合物分子链的充分扩散和化学交联反应的进行, 从而提高涂膜的物理化学性能, 当甲基丙烯酸缩水甘油酯(GMA)含量为10 wt%时, 涂膜的拉伸强度达20.3 MPa.

关键词 [乳液聚合](#) [反应性复合乳液](#) [核壳结构](#) [交联反应](#) [扩散](#)

分类号

SYNTHESIS, CHARACTERIZATION AND CROSSLINKING REACTION OF REACTIVE COMPOSITE LATEX

ZHANG Jide, YANG Mujie, YANG Huan, ZHU Yangrong

Department of Polymer Science and Engineering; Zhejiang University; Hangzhou 310027

Abstract Three types of core / shell latexes which containing epoxy groups in the core layer or on the shell layer and carboxyl groups on the shell layer respectively were synthesized by seeded semicontinuous emulsion polymerization. Two types of reactive blend latexes were obtained by blending epoxy group functional latex and carboxyl group functional latex. The core / shell morphology of latex particles was clearly observed by TEM. The size and distribution of the emulsion particles were investigated by DLS analysis. The latex particles are narrowly dispersed with polydispersity index of 0.062 and number-average diameter of 76 nm. The diffusion and cross-linking of polymer chains for blend latex particles were investigated by measurement of gel content, swell ratio and FTIR. The influences of different core / shell structure of blend latexes on mechanical properties of the films were described. The results in theate that the polymer chains diffusion and cross-linking reaction are enhanced when the epoxy groups are in the core layer and carboxyl groups in the shell layer of latex particles, as a result, the physical and chemical performance of latex films are improved. The tensile strength of blend A film is 20.3 MPa when the glycidyl methacrylate(GMA) content is 10wt%.

Key words [Emulsion polymerization](#) [Reactive composite latex](#) [Core/shell structure](#) [Cross-linking reaction](#) [Diffusion](#)

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通讯作者 杨慕杰

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