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论文

原位实时近红外光谱研究核壳乳液聚合过程

高文骥, 袁洪福, 邱藤, 李效玉

北京化工大学材料科学与工程学院, 碳纤维和功能高分子教育部重点实验室, 北京 100029

摘要:

将苯乙烯(St)和丙烯酸丁酯(BA)单体以不同的聚合方式制备核壳乳液和共聚乳液, 并采用近红外光谱技术实现了对乳液反应过程的原位实时监测, 通过对近红外光谱的谱带归属和主成分分析, 为近红外光谱技术判别乳液聚合过程提供了科学依据, 也为判断反向核壳乳液核壳翻转的拐点提出了一种新的方法. 采用簇类独立软模式法(SIMCA)建立了定性判别模型, 得到了很好的判别结果, 为进一步研究近红外光谱技术用于核壳乳液聚合过程奠定了基础.

关键词: 核壳乳液; 近红外光谱; 谱带归属; 主成分分析; 簇类独立软模式法

Research of Core-shell Emulsion Polymerization Using *in-situ* Near Infrared Spectroscopy

GAO Wen-Ji, YUAN Hong-Fu*, QIU Teng, LI Xiao-Yu

School of Materials Science and Engineering, Key Lab of Carbon Fiber and Functional Polymer Materials, Ministry of Education, Beijing University of Chemical Technology, Beijing 100029, China

Abstract:

Near-infrared spectroscopy was employed in monitoring the core-shell emulsion polymerization and emulsion copolymerization of styrene(St) and butyl acrylate(BA). The three different polymerizations are differentiated by the band assignment and principal component analysis(PCA). The reversal process of inverted core-shell structure can be visually revealed by this method. The soft independent modeling of class analogy(SIMCA) classification model was established, which provides scientific basis for using near-infrared spectrometry to discriminate the core-shell polymerization types.

Keywords: Core-shell emulsion; NIR spectroscopy; Band assignment; Principal component analysis; Soft independent modeling of class analogy

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通讯作者: 袁洪福, 男, 教授, 主要从事近红外光谱分析技术研究. E-mail: hfyuan@mail.buct.edu.cn

作者简介:

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