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论文

采用XPS与接触角法研究氟聚合物表面结构与性能

张庆华, 刘龙孝, 陈丰秋, 詹晓力

浙江大学化工系, 杭州 310027

摘要:

本文采用接触角和变角XPS方法对FA共聚物的表面能、 表面微相结构做了进一步的研究.

关键词: 氟聚合物; 表面能; 接触角; X射线光电子能谱

Surface Structure and Properties of Fluorocopolymers Studied by XPS and Contact Angle

ZHANG Qing-Hua, LIU Long-Xiao, CHEN Feng-Qiu, ZHAN Xiao-Li

Department of Chemical Engineering, Zhejiang University, Hangzhou 310027, China

Abstract:

The surface composition and properties of the copolymer miniemulsions containing fluorinated acrylate (FA) were investigated by X-ray photoelectron spectroscopy(XPS) and contact angle measurements. The surface energy of these copolymers was calculated by the harmonic equation from the static contact angles. The surfaces of the copolymers are very hydrophobic even with a low content of FA due to the surface enrichment of FA segments. The surface energy of copolymers decreases drastically with the increase of FA content and can reach 11.6 mN/m when the concentration of FA in copolymerization increases to 17.54%. The element composition and surface segregation of the fluorinated component as a function of depth of fluorocopolymer thick films were investigated by angle-dependent XPS. The content of fluorine on the surface of copolymers was higher than the calculated value according to the feeds. Our analyses demonstrate that the side groups containing fluorine tend to enrich on the copolymer-air interface. The surface segregation is enhanced when the samples are annealed, which results in further decrease of surface energy.

Keywords: Fluorocopolymer; Surface energy; Contact angle; X-ray photoelectron spectroscopy

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通讯作者: 詹晓力(1964年出生), 男, 教授, 博士生导师, 从事反应工程与精细高分子领域的研究. E-mail: xlzhan@zju.edu.cn

作者简介:

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