

研究论文

新型聚乙烯接枝共聚物的制备与表征

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摘要 以聚氧乙烯和全氟辛基聚氧乙烯醚(FPEOE)为起始原料, 合成了一系列的特种氟表面活性剂及其丙烯酸酯, 用FTIR和¹H NMR对其结构进行了表征, 用最大气泡法测定了其表面张力. 以其作为接枝单体, 利用反应挤出接枝的方法制备了系列功能化聚乙烯, 用FTIR确定了接枝共聚物的结构和接枝率; 用DSC、接触角测量仪和XPS对接枝共聚物的热性能、结晶行为和表面性能进行了测试分析. 结果表明, 随着聚氧乙烯分子量的增加, 氟表面活性剂的表面活性降低; 聚乙烯接枝共聚物的结晶温度高于线形低密度聚乙烯, 且具有较好的亲水性.

关键词 [氟表面活性剂](#) [DSC热分析](#) [表面张力](#) [聚乙烯接枝共聚物](#)

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Preparation and Characterization of Novel Graft Copolymers of LLDPE

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Abstract A series of novel fluorine surfactants, a, b, c, d, e and their acrylates, A, B, C, D and E, were synthesized *via* poly(ethylene oxide) (PEG) (200, 600, 1000, 2000, 5000) and perfluorooctane poly(ethylene oxide) ether as the main starting materials. Their chemical structures were characterized by means of FTIR and ¹H NMR. The surface activity and surface tension (γ) of surfactants a, b, c, d and e were evaluated by maximum bubble pressure method. Surfactants A, B, C, D and E were adopted as the grafting monomers of linear low density polyethylene (LLDPE), and grafting reaction was carried out by melt reactive extrusion procedure. Their surface properties were characterized with measuring contact angle and XPS. It was found that the hydrophilic property of the graft copolymers was better than the plain LLDPE. Thermal properties of graft copolymers were studied by DSC. It was found that their crystalline temperatures of graft copolymers were faster than that of the plain LLDPE.

Key words [Fluorine surfactant](#) [DSC thermal analysis](#) [Surface tension](#) [Graft copolymers of LLDPE](#)

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