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# Synthesis, Characterization and Surface Properties of Cross-linked Polyurethane Dispersions Modified by Organosiloxane

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收稿日期 修回日期 网络版发布日期 接受日期

摘要 A series of cross-linked polyether-polyester polyurethane dispersions modified with organosiloxane were prepared based on hydroxyl-terminated polydimethylsiloxane (HTPS) as hydrophobic component and 3-aminopropyl-triethoxysilane (APTS) as cross-linker as well as a bridge between polyurethane (PU) and polysiloxane (PSIL). It was discovered that polydimethylsiloxane segments were incorporated into PU chains chemically and organosiloxane was preferentially oriented toward the surface layer of the film by making a comparison of attenuated total reflection (ATR) spectra between the copolymer and the blend of PU and PSIL, which was further confirmed by investigation of electron spectroscopy for chemical analysis (ESCA). The relationships between surface properties of the film formed from polyurethane dispersion and organosiloxane content were also studied. The results showed that water contact angle of the film increased with the increase of organosiloxane content. Interestingly, it was also found that water contact angle of PUS film increased firstly and then decreased when film-forming temperature varied from 25℃ to 55℃.

关键词 polydimethylsiloxane (PDMS),surface properties,polyurethane,contact angle,characterization

分类号

**DOI:**

对应的英文版文章:205376

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