

GRAFTING OF BORON CLUSTER COMPOUNDS ONTO DIFFERENT SUBSTRATES

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Abstract

Natural and synthetic polymers play crucial roles in many areas of life, industry, research and medicine. Modification of many of these useful polymers has expanded their potential for application greatly. In this context, many modification approaches have been developed to change surface properties, e.g. by the physical or chemical treatment of surfaces. In this work we have modified surfaces of different substrates (polymer foils, glasses, and montmorillonite substrates) by chemical methods, and we have studied the resultant changes of surface properties of the modified substrates. In all cases, the substrate surfaces were firstly pre-treated with piranha solutions (mixtures of sulphuric acid and hydrogen peroxide). Subsequently, the activated surfaces were grafted with selected vicinal compounds and then with some boron cluster compounds (highly fluorescent boron hydride cluster anti-B₁₈H₂₂ or its thiolated derivative 4,4'-(HS)₂-anti-B₁₈H₂₀). The surface properties of the modified materials changed significantly and were studied using various methods, such as X-ray photoelectron spectroscopy, electrokinetic analysis, goniometry, and UV-Vis spectroscopy. These materials with modified surfaces could be of potential use in, for example, the tissue engineering field.

Keywords: Surface properties, chemical treatment, grafting of compounds on substrates

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