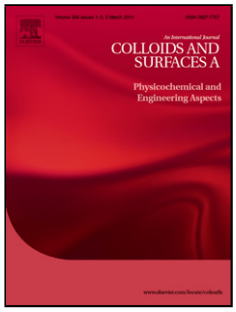

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Surface Physicochemical and Structural Analysis of Functionalized Titanium Dioxide Films

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Titanium and its alloys are recognized as acceptable materials for many applications. The properties of titanium dioxide (TiO_2) thin films are directly related to the structural characteristics of the material, which can be modified with tailor-made functional groups. Reactive bifunctional groups can be bound with hydroxyl-terminated TiO_2, leading to the formation of self-assembled monolayers or multilayer films. The understanding of such interactions is necessary to design functional oxide coatings for a large variety of applications. In this study, nanosized TiO_2 films were synthesized by the sol-gel method and deposited by spin coating technique upon titanium substrate. Subsequently, TiO_2 thin films were functionalized with (3-aminopropyl)trimethoxysilane (APTMS), 3-(4-aminophenyl)propionic acid (APPA), 3-mercaptopropionic acid (MPA) or polyethylene glycol (PEG). Surface characterization by XPS, surface roughness, and contact angle indicated successful functionalization and allowed for