Preparation of phosphate superhydrophobic, superoleophobic, and superoleophobic adhesive coatings

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Abstract: Superhydrophobic materials have been widely studied for their unique properties such as selfcleaning and antiicing. Most of the superhydrophobic coatings are difficult to fill with superhydrophobic, superoleophobic, and superoleophobic adhesive at same time. In this paper, nano silica particles modified by perfluorodecyltrimethoxysilane were introduced into the phosphate system. The phosphate anti bonding coating has good adhesive properties, with a water contact angle of 161°and a rolling angle of 2.4°. with a oil contact angle of 150. And the wettability, microstructure, chemical composition, mechanical properties, wear resistance, conductivity, anti bonding performance, and compatibility between the coating and propellant were studied. It can been found micro nano porous structures and low surface energy with enough F elements are the key factor for the superhydrophobic, superoleophobic, and superoleophobic adhesive properties.

Keywords: phosphatel superoleophobic adhesivel phosphate coatings