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Friction reducing behavior of stearic acid film on a textured aluminum substrate

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Abstract: A simple two-step process was developed to render the aluminum hydrophobicity with lower friction. The textured aluminum substrate was firstly fabricated by immersed in a sodium hydroxide solution at 100 °C for 1h. Stearic acid film was then deposited to acquire high hydrophobicity. Scanning electron microscopy, IR spectroscopy and water contact angle measurements were used to analyze the morphological features, chemical structure and hydrophobicity of prepared samples, respectively. Moreover, the friction reducing behavior of the organic-inorganic composite film on aluminum sliding against steel was evaluated in a ball-on-plate configuration. It was found that the stearic acid film on the textured aluminum led to decreased friction with significantly extended life.

Keywords: Nanotexture; Surface Modification; Film; Stearic acid; Aluminum

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