Super water-repellent Characteristics for Aluminium Surfaces Coated by Two-step Chemical Process

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Recently, products using super-hydrophobic have been widely applied in automobile, clothing, camping equipment, etc. Currently, polymeric super-hydro phobic products have been developed and commercialized As a representative polymeric super-hydrophobic material. In this paper, superhydrophobic coatings on aluminium surfaces was prepared using a two-step process, where roughening of aluminium surface is formed by immersing in KOH solution, and then coating on the rough aluminum surface with ethanol solution of lauric acid solution was done to lower the surface energy. The contact angle measurements confirm the superhydrophobicity. Water contact angle as high as 153° was obtained on treated surface for 60 min and 30 min in KOH solution of 10 % and ethanol solution of lauric acid solution, respectively. Experimentally, it has been observed that the superhydrophobicity of the coating is thermally stable up to 150 °C and is also stable to ultraviolet radiation for 24 hours. The super water repellent nature is unaffected by tape test of 10 times, revealing the mechanical strength of coatings. Further, the lost superhydrophobicity of coatings can be restored by simply immersing in lauric acid for 30 min. In addition, Superhydrophobic aluminium coatings show the excellent self-cleaning nature and does not change even after 10-day immersion in 3% NaCl solutions, confirming the anticorrosive properties of coatings.