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Green and timesaving fabrication of a superhydrophobic surface and its application to anti-icing, self-cleaning and oil-water separation

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Abstract:

A timesaving method based on inexpensive and nontoxic chemicals is adopted to fabricate a superhydrophobic surface for engineering applications. The characterization of chemical compositions and microstructures indicates that this superhydrophobic surface is achieved successfully by the chemical etching and stearic acid modification. This method is applicable to a surface with super hydrophobicity for many metal materials. It is important to note that the ultra-hydrophobic aluminum surface is of good bounce dynamics for different sizes of a water droplet. The water contact & sliding angle are 155° and 1° respectively on the prepared superhydrophobic surface. As expected, the sliding angle of below 1° is the key to obtain excellent anti-icing property on a superhydrophobic surface. Water droplets are prone to roll off the superhydrophobic surface, leading to the freezing delay and self-cleaning performance for

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