

Accepted Manuscript

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PII: S0167-577X(16)31977-2
DOI: <http://dx.doi.org/10.1016/j.matlet.2016.12.093>
Reference: MLBLUE 21905

To appear in: *Materials Letters*

Received Date: 21 September 2016
Revised Date: 27 December 2016
Accepted Date: 28 December 2016

Please cite this article as: Y. Liu, Q. Wang, X. Zhu, F. Yang, M. Yasir Akram, J. Nie, Preparation of Superhydrophobic Surface via One-step Photopolymerization, *Materials Letters* (2016), doi: <http://dx.doi.org/10.1016/j.matlet.2016.12.093>

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Preparation of Superhydrophobic Surface via One-step Photopolymerization

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Abstract

In this work, one superhydrophobic surface was facilely achieved by one-step photopolymerization of tridecafluorooctyl acrylate (G06C) with solvent. The superhydrophobic property was created by the combination of low surface energy material polytridecafluorooctyl acrylate and the rough structure created by the solvent evaporation. The roughness of Polytridecafluorooctyl acrylate (PG06C) coating was determined by the content of solvent.

Keywords: Superhydrophobic; Photopolymerization; Microstructure; Surface

1. Introduction

In nature, lots of biological surfaces, such as lotus leaves, shark, have the feature of superhydrophobicity which endows the surface with the performance of non-wetting and self-cleaning. Such surface has potential applications for anti-icing [1, 2], self-cleaning [3, 4], anti-fog [5-7]. For these special properties and the potential applications, it has attracted people's great interest to mimic and fabricate superhydrophobic surface. The mechanism of superhydrophobicity was explained by the Cassie-Baxter model which superhydrophobic surface has nano/microstructure and the air was trapped in the microgrooves of the rough surface and water droplets rested on the microstructure surface [3].

There are two main strategies employed to prepare superhydrophobic surface: (1) top-down approaches,

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