

Accepted Manuscript

Autoclaving-induced in-situ grown hierarchical structures for construction of superhydrophobic surfaces: A new route to fabricate antifouling coatings



Xiaoyan He, Pan Cao, Feng Tian, Xiuqin Bai, Chengqing Yuan

PII: S0257-8972(18)31112-5
DOI: [doi:10.1016/j.surfcoat.2018.10.015](https://doi.org/10.1016/j.surfcoat.2018.10.015)
Reference: SCT 23878
To appear in: *Surface & Coatings Technology*
Received date: 20 July 2018
Revised date: 4 October 2018
Accepted date: 6 October 2018

Please cite this article as: Xiaoyan He, Pan Cao, Feng Tian, Xiuqin Bai, Chengqing Yuan , Autoclaving-induced in-situ grown hierarchical structures for construction of superhydrophobic surfaces: A new route to fabricate antifouling coatings. Sct (2018), doi:[10.1016/j.surfcoat.2018.10.015](https://doi.org/10.1016/j.surfcoat.2018.10.015)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Autoclaving-induced *in-situ* grown hierarchical structures for construction of superhydrophobic surfaces: A new route to fabricate antifouling coatings

Xiaoyan He ^{a,b}, Pan Cao ^{a,c}, Feng Tian ^{a,b}, Xiuqin Bai ^{a,b,&}, Chengqing Yuan ^{a,b}

^a Reliability Engineering Institute, National Engineering Research Center for Water Transport Safety, Wuhan University of Technology, Wuhan 430063, China

^b Key Laboratory of Marine Power Engineering and Technology, Ministry of Transport, Wuhan University of Technology, Wuhan 430063, China

^c College of Mechanical Engineering, Yangzhou University, Yangzhou 255127, China

& Corresponding author.

E-mail address: xqbai@whut.edu.cn

ABSTRACT

A simple fabrication method was developed to prepare a superhydrophobic aluminum surface. The approach involved the *in-situ* formation of a micro/nano-structure and fluorination treatment on an aluminum surface. Based on the combination of micro/nanostructures and low-energy compositions, the as-prepared surface became super-repellent toward deionized water and biological liquids including egg white and egg yolk. A water contact angle of 160° and a contact angle hysteresis of 1.8° were observed on the fluorinated aluminum surface with hierarchical structures. Meanwhile, the surface presented excellent antifouling performance against marine diatom *Phaeodactylum tricornutum* by the air layer captured within the micro/nanostructures. The results indicated that the structures played a critical role in the formation of a superhydrophobic surface with excellent antifouling capability. The work provides a simple and highly efficient method to fabricate superhydrophobic aluminum surfaces with exceptional antifouling performance.

Download English Version:

<https://daneshyari.com/en/article/11008885>

Download Persian Version:

<https://daneshyari.com/article/11008885>

[Daneshyari.com](https://daneshyari.com)