

Author's Accepted Manuscript

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PII: S0167-577X(16)31503-8
DOI: <http://dx.doi.org/10.1016/j.matlet.2016.09.043>
Reference: MLBLUE21481

To appear in: *Materials Letters*

Received date: 20 July 2016
Revised date: 2 September 2016
Accepted date: 11 September 2016

Cite this article as: Longqiang Ye, Yulu Zhang, Changchun Song, Yuanyang Li and Bo Jiang, A simple sol-gel method to prepare superhydrophilic silica coatings, *Materials Letters*, <http://dx.doi.org/10.1016/j.matlet.2016.09.043>

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A simple sol-gel method to prepare superhydrophilic silica coatingsLongqiang Ye^{a*}, Yulu Zhang^b, Changchun Song^a, Yuanyang Li^c, Bo Jiang^c^aCollege of Chemistry and Materials Engineering, Anhui Science and Technology University, Fengyang, Anhui 233100, China^bSuzhou Institute of Nano-Tech and Nano-Bionics, Suzhou, 215123, China^cCollege of Chemistry, Sichuan University, Chengdu, 610064, China.

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Abstract

A highly transparent and mechanically robust superhydrophilic silica coating was prepared by sol-gel method followed by calcination, using tetraethoxysilane (TEOS) as precursor and hydrochloric acid (HCl) as catalyst. The superhydrophilic coating showed excellent anti-fogging characteristic in humid environment. The effect of calcination on the microstructure and chemical composition of the coating was discussed in detail. This transparent and mechanically robust superhydrophilic coating can find potential application in windshields, eyeglasses and solar cells.

Keywords: sol-gel preparation, thin films, superhydrophilic, transparent, mechanically robust, anti-fogging

1. Introduction

Surfaces that are completely and instantaneously wet by water (water droplet contact angle $<5^\circ$ within 0.5 s or less), named as superhydrophilic surfaces, have great potential in terms of antifogging, self-cleaning and biocompatible applications [1-5].

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