Editorial

Nanostructured Surfaces, Coatings, and Films 2014

Mengnan Qu,¹ Jiamin Wu,² Qi Wang,³ Yuanlie Yu,⁴ and Jinmei He¹

¹College of Chemistry and Chemical Engineering, Xi'an University of Science and Technology, Xi'an, China

²Department of Chemical and Petroleum Engineering, University of Pittsburgh, Pittsburgh, PA, USA

³Department of Physics, Lanzhou University, Lanzhou, China

⁴Advance Membranes and Porous Materials Center, King Abdullah University of Science and Technology, Jeddah, Saudi Arabia

Correspondence should be addressed to Mengnan Qu; mnanqu@gmail.com

Received 29 June 2015; Accepted 1 July 2015

Copyright © 2015 Mengnan Qu et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Nanotechnology makes it possible to intentionally modify the properties of surfaces and endow them with any desired function. Nanostructured surfaces, coatings, and films have represented important advances in control of wetting, adhesion, mechanical, thermal, magnetic, electrical, and optical properties and ability to direct cell behavior. A number of promising approaches to fabricate functional micro- and nanostructured surfaces, coatings, and films have been stimulated by opportunities to enhance the properties of surfaces and interfaces *via* the combination of surface structure, morphology, and physical and chemical properties. Such functional micro- and nanostructured surfaces, coatings, and films are playing an increasingly important part in a broad range of novel applications, such as energy, electronics, photonics, as well as sensor systems, advanced materials, and medical devices.

This special issue features articles that cover a wide range of recent progress in design, fabrication, and characterization of innovative nanostructured surfaces with the aim of improving their surface properties and functional performance, as well as new insights on physical principles underlying their properties and enormous potential applications. Highlighted below are important contributions from this special issue.

C. Song et al. address the growth of semimetal bismuth and antimony films on reactive substrate. The strategy presented is facile and cost effective, which may develop the design of functional thin films of metal or other inorganic materials.

B. Bo et al. present the study on the adsorption of organic dyes by TiO₂@yeast-carbon composite microspheres and their *in situ* regeneration evaluation. The results will be useful for further research and practical applications of the novel TiO₂@yeast composite in dye wastewater treatment.

R. Liao et al. report glaze icing on superhydrophobic coatings prepared by nanoparticles filling combined with etching method for insulators. The coated glass slides and glass insulators show excellent anti-icing performance at low temperature.

N. Sultana et al. fabricate the polycaprolactone/gelatin-based electrospun nanofibers and evaluate their antibacterial properties. The results confirm that the nanofibers are suitable for use in inhibiting bacterial infections and protecting the injured parts of both skin and tissues from contamination.

X. Liu et al. investigate the magnetization reversal process in FeCo/Ru/FeCo exchange coupled synthetic antiferromagnetic multilayers. The results show that the two magnetic layers have the same domain structure and the domain structures were reversed correspondingly when the applied field is smaller than the exchange coupling field.

Q. Wang et al. prepare a low-stress, elastic, and improved hardness hydrogenated amorphous carbon film. The results show that, at the hydrogen flow rate of 50 sccm, the deposited films have lower compressive stress, higher elastic recovery, and higher hardness, compared with the films deposited without hydrogen introduction.

H. Chen et al. describe a facile strategy for functionalization of boron nitride nanotubes with Pd nanoparticles.

The good catalytic activity of the Pd nanoparticles decorated boron nitride nanotubes to be a potential candidate in the application of electronic and catalysis fields.

Z. Qi et al. investigate the evolution of morphology and hydrophobicity of superhydrophobic polyimide surfaces under different ultraviolet intensities. This work will further promote the application of UV method in polyimide superhydrophobic materials.

F. Yang et al. address electrodeposition and characterization of CuTe and Cu₂Te thin films. The results suggest that the epitaxial electrodeposition is an ideal method for deposition of compound semiconductor films for photoelectric applications.

J. He et al. fabricate mechanical durable polysiloxane superhydrophobic materials. The materials show stable superhydrophobicity after the surfaces undergo a long distance friction and its superhydrophobicity can be even slightly enhanced by the surface abrasion.

J. Gou et al. investigate the photoluminescence behaviors of the reddish orange emitting phosphor (CaIn₂O₄: Sm³⁺ codoped with Zn²⁺ or Al³⁺ ions). The excellent luminescence properties demonstrate the potential application as new-style reddish orange phosphors on light emitting diode.

Z. Liu et al. synthesize graphene wrapped Sn_xTi_{1-x}O₂ nanoparticles as anode materials and investigate their electrochemical performance. The results indicate that Sn_xTi_{1-x}O₂ solid solutions can be used as anode materials for Li-ion batteries.

G. Li et al. investigate the structural and magnetic properties of the Ni₈₁Fe₁₉ thin film grown on the Si substrate. The results confirm that Ni₈₁Fe₁₉/graphene heterostructure is a potential candidate for spin injection source into semiconductor channel.

C. W. Lai synthesizes the anodic TiO₂ films with different surface morphologies using electrochemical anodization technique. The anodic TiO₂ nanotubes generate a good photocurrent response of 1 mA/cm² with photoconversion efficiency of 2% in the photoelectrochemical water splitting studies.

As guest editors for this special issue, we hope that this special issue will not only provide the readers with accurate data, updated research, and important questions to be resolved, but also stimulate further developments in the field of nanostructured surfaces, coatings, and films.

Acknowledgments

The editors gratefully thank the authors for their contributions to this special issue and the reviewers for their constructive comments.

*Mengnan Qu
Jiamin Wu
Qi Wang
Yuanlie Yu
Jinmei He*