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Electrospinning superhydrophobic nanofibrous poly(vinylidene fluoride)/stearic acid coatings with excellent corrosion resistance

Mengke Cui^a, Changcheng Xu^a, Yongqian Shen^{*b}, Haifeng Tian^a, Hua Feng^a, Jian

Li^{*a}

^a College of Chemistry and Chemical Engineering, Northwest Normal University, Lanzhou 730070, P. R. China.

^b State Key Laboratory of Advanced Processing and Recycling of Non-ferrous Metals, Key Laboratory of Nonferrous Metal alloys and Processing, Ministry of Education, School of Materials Science & Engineering, Lanzhou University of Technology, Lanzhou 730050, China.

Abstract

Due to the unique micro/nanoscale rough surface structures and water-repellency, the superhydrophobic surfaces hold great potential of anti-corrosive protection. This study reported a facile and controllable electrospinning technology to fabricate polyvinylidene fluoride (PVDF)/stearic acid (SA) nanofibers onto metal substrates for long-time anti-corrosive protection. Moreover, the anti-corrosion performances of the superhydrophobic nanofibers coated metal substrates were characterized by the Tafel polarization curve and electrochemical impedance spectroscopy (EIS). In addition, the electrochemical corrosion test results demonstrated the superhydrophobic PVDF/SA nanofibrous coatings possessed superior anti-corrosion performances for long-term metal substrates preservation, even after being immersed in a 3.5 wt % NaCl aqueous

^a * Corresponding author. Tel.: +86 931 7971533.
E-mail address: jianli83@126.com (J. Li).

^b * Corresponding author. Tel.: + 86 931 2976688.
E-mail address: syqch@163.com (Y. Shen).

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