Effect of the Morphology of Electrospun Polyvinylidene Fluoride Nanofiber on Corrosion Property of Q345 Steel

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Different contents of polyvinylidene fluoride (PVDF) nanofiber membranes were electrospun on Q345 steel surface. Nanofiber morphology was observed via scanning electron microscopy. The samples were immersed in 3.5 wt. % solutions, and an electrochemical workstation was used to investigate the anticorrosion performance of the nanofiber membranes. Electrochemical impedance spectroscopy measurements indicated that the electrospun PVDF nanofiber membranes effectively protected the Q345 steel. Nanofiber morphology significantly influenced its protection property. The nanofiber membranes with uniform thickness exhibited better performance than the membranes with a beaded structure. The nanofiber membrane included in the epoxy resin composite coating improved protection performance of the coating.

Keywords: Electrospun; Nanofiber membrane; EIS; Corrosion

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