Short Communication

Corrosion Behavior of Carbon Nanotubes/Polyurea Composite Coatings in Alkaline Environment

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The carbon nanotubes (CNTs) were doped into polyurea for the test of Shore hardness and the adhesion on the aluminum alloy substrate. The corrosion resistance of carbon nanotube/polyurea composite coatings was investigated by electrochemical impedance spectroscopy (EIS) in 0.1 mol/L NaOH solution for 21 days. The results showed that the surface hardness of polyurea was significantly improved after doping with CNTs while the adhesion to aluminum alloy substrate was slightly improved. The coating equivalent capacitance (R_c) and charge transfer resistance (R_{ct}) of the polyurea coating added with CNTs were larger than the pure polyurea coating during immersion, indicating that adding CNTs can provide better protection to the aluminum alloy substrate. The relationship between the doping amount of carbon nanotubes and corrosion resistance is $1.0 \text{ wt.}\% > 0.5 \text{ wt.}\% > 0 \text{ wt.}\%$.

Keywords: polyurea, carbon nanotubes, adhesion, EIS, corrosion resistance

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