Short Communication

Corrosion Resistance Research of ZnO/polyelectrolyte Composite Film

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A composite film consisting of zinc oxide (ZnO) and polyelectrolyte, poly (diallyldimethylammonium chloride) (PDDA), has been successfully fabricated on a carbon steel substrate by a simply electrochemical deposition method. The fabrication mechanisms are based on electrophoretic deposition of PDDA and electrolytic deposition of ZnO. FT-IR results indicate the existence of PDDA. SEM results show that compared with ZnO film, the composite film becomes more compact and smooth. It demonstrates that the surface morphology of the film is increased because of the existence of PDDA. Polarization curves show that the substrate coated with composite film has a lower corrosion current density and a more positive corrosion potential value than bare and ZnO coated samples. The superior corrosion resistance can be attributed to PDDA, which can improve the stability of the film. The resulted film may be a potential anticorrosion coating for metal corrosion protection.

Keywords: ZnO; PDDA; composite film; carbon steel; corrosion

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