Electrosynthesis and Characterization of Polythiophene and Corrosion Protection for Stainless Steel

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Polythiophene (PTh) films were electrosynthesized on stainless steel (SS) in Boron trifluoride diethyl etherate (BFEE) solution containing thiophene by potentiostatic method. The structure, morphology and thermostability of PTh films were studied by scanning electron microscopy (SEM) and UV-Vis diffuse. The corrosion protection behavior of the films were characterized in 3.5 wt.% NaCl solution by linear potentiodynamic polarization (Tafel) and electrochemical impedance spectroscopy (EIS). It was found that after long immersion times (779 h), the best protection efficiency was 0.3 mol thiophene in BFEE potentiostatic synthesised 1.3 V for 1000 s.

Keywords: Electrosynthesis; polythiophene; corrosion protection; stainless steel

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