عنوان مقاله:

Corrosion Investigation of Polypyrrole-Coated Mild Steel Using Electrochemical Impedance Spectroscopy

محل انتشار:

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خلاصه مقاله:

Conductive polymer coatings can be prepared from electro conductive polymers such as polypyrrole. Pyrrole monomer has been proven to be an effective corrosion inhibitor for steel, while its polymer has been shown to protect steel from corrosion in different electrolytes. One of the major variables in the deposition of polypyrro1e coatings on metallic substrates is electro deposition over potential In this research. electrochemical impedance spectroscopy (EIS) was performed during the deposition of polypyrrole on a mild steel substrate at different over potentials. Electro deposition was carried out in aqueoussolution containing 0.1 M oxalic acid and 0.2 M pyrrole. According to the charge transfer resistance of electro deposition at various over potentials, three distinct regions of potentials including 10-60 mY. 60-90 mV and above 90 mV were determined. In each region, the variation of the charge transfer was constant, but different from other regions. Electro deposition of pyrrole was performed galvanostatically at these three potential regions. Corrosion resistance of mild steel substrates coated by polypyrrole in each region was investigated in 0.1 M NaCl solution using potentiodynamic polarization and electrochemical impedance spectroscopy techniques. According to corrosion data. the corrosion resistance of polypyrrole coated mild steel as a function of electro deposition over potential was obtained and presented. In addition, Scanning Electron Microscopy (SEM) was employed to investigate .the characteristics ofcoatings produced

کلمات کلیدی:

Conductive polymer. polypyrrole, over potential, corrosion, electrochemical impedance spectroscopy, morphology