

Comparative corrosion resistance study of the of polypyrrole and polyaniline films electrodeposited on aluminum

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Aluminum alloys are susceptible to pitting corrosion in some aggressive media. To prevent the corrosion of the aluminum, conducting polymers such as Polypyrrole (PPy) and Polyaniline (PAni) have been investigated [1]. From this perspective, this research presents the electrodeposition of PPy and PAni films on 2024-T3 aluminum alloy, in aqueous medium containing sulfuric acid. The effectiveness of the films was investigated by open circuit potential, potentiodynamic polarization and electrochemical impedance spectroscopy in chloride medium. The electrochemical parameters such as polarization resistance and corrosion potential indicate that both PPy and PAni films can protect the metal against corrosion. However, the aluminum surfaces that were coated with PAni, exhibited a more positive corrosion potential comparing with the ones coated with PPy, showing to be more efficient. Furthermore, the morphology was analyzed by scanning electron microscopy (SEM) and showed homogeneous and adherent films in both cases.

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References:

[1] ATES, M., SARAC, A. S. Conducting Polymers and their Applications, **Current Physical Chemistry**, v. 2, n.3, p. 223-240, 2012.