

## Corrosion Studies of Electrodeposited Polypyrrole Coatings on Al 2024-T3 Alloy

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Electroactive conductive polymers (ECPs) are being investigated for corrosion protection of structural alloys, with a view toward replacement of chromate-based coating systems. However, the formation of uniform, well-adherent coatings of ECPs on active metals is a challenge. Our laboratory has developed a method for the direct galvanostatic electrodeposition of polypyrrole (Ppy) coatings on Al 2024-T3 alloy using an electron transfer mediator (4,5-dihydroxy-1,3-benzenedisulfonic acid disodium salt, also known as Tiron<sup>®</sup>). The Tiron also serves as the dopant anion for the polymer. The Ppy coatings thus produced clearly alter the corrosion behavior of the Al alloy. In this paper, the performance of the electrodeposited Ppy coating for corrosion protection as assessed by long-term immersion and by Prohesion<sup>®</sup> studies will be described. The scanning vibrating electrode technique (SVET), electrochemical impedance spectroscopy (EIS) and linear polarization methods were utilized to better understand the interactions of the electrodeposited Ppy coatings with the aluminum alloy. Results of these studies will be presented.