

## Synthesis, characterization and corrosion resistance of electroless nickel-phosphorus and nickel-phosphorus-SiC coatings: A comparative study

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Nickel-phosphorus and nickel-phosphorus-SiC coatings were obtained by electroless deposition processes using laboratory made and commercial nickel/ hypophosphite based baths. The characterization techniques included scanning electron microscopy (SEM), glow discharge optical emission spectroscopy (GD-OES) and X-ray diffraction (XRD). All deposits showed an amorphous micro-structure and high phosphorus content. The incorporated SiC particles constituted about 10 wt.% of the composite deposits. The techniques used to study the corrosion resistance in 3.5 wt.% NaCl were linear polarization resistance (LPR), Tafel plots and electrochemical impedance spectroscopy (EIS). The results showed that nickel-phosphorus-SiC deposits experienced lower corrosion currents compared with the nickel-phosphorus coatings. This fact can be ascribed to the decrease in the effective surface area available for corrosion. Concerning the mechanism by which nickel-phosphorus and nickel-phosphorus- SiC deposits become corroded, through EIS experiments and Tafel plots, it was shown that the corrosion kinetics involved a charge transfer mechanism.

Bewertung: Noch nicht bewertet

### Preis

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