

## **Corrosion resistance of electroless Cu-P and Cu-P-SiC composite coatings in 3.5% NaCl**

### **Abstract**

The Cu-P and Cu-P-SiC composite coatings on carbon steel substrates were deposited via electroless plating. The anti-corrosion properties of Cu-P and Cu-P-SiC coatings were studied in 3.5% NaCl solution. The anti-corrosion properties of Cu-P and Cu-P-SiC coatings were investigated in 3.5% NaCl solution by the weight loss, potentiodynamic polarisation and electrochemical impedance spectroscopy (EIS) techniques. It has been found that the shift in the corrosion potential ( $E_{\text{corr}}$ ) towards the noble direction, decrease in the corrosion current density ( $I_{\text{corr}}$ ), increase in the charge transfer resistance ( $R_{\text{ct}}$ ) and decrease in the double layer capacitance ( $C_{\text{dl}}$ ) values indicated an improvement in corrosion resistance with the incorporation of SiC particles in the Cu-P matrix. The effects of varying the SiC concentration on the corrosion resistance of carbon steel were investigated and it was found that the best anti-corrosion property of Cu-P-SiC is at  $5 \text{ g L}^{-1}$  SiC in the bath formulation.