

## Electrochemical, Structural and Nano Tribological Behavior of Ni-W-PTFE Nanocomposite Coatings Prepared by Tartrate Bath

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A tartrate nickel plating bath has been used to prepare nickel- tungsten (Ni-W) dispersed PTFE composite coatings with four different PTFE contents (0, 4, 8 and 20  $\text{gl}^{-1}$ ). The coatings are characterized using of Field-Emission Scanning Electron Microscopy (SEM), Energy Dispersive X-ray Analysis (EDAX) and X-ray Diffractometry (XRD). XRD results indicate that the PTFE particle changed the surface texture significantly. The nano tribological behavior of the nano composite coating was estimated by contact mode of AFM. Electrochemical performance of the nanocomposite depositions was evaluated using potentiodynamic polarization and electrochemical impedance spectroscopy (EIS). The results show that the Ni-W/PTFE nanocomposite films exhibit better electrochemical and tribological performance than the Ni-W coating. The corrosion rate and surface roughness decreased about 50 and 5 times less than bare coating in optimum condition 8  $\text{gl}^{-1}$  PTFE.

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**Keywords:** Ni-W/PTFE, nanocomposite coatings, tartrate bath, nano-tribological, electrochemical performance.

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