

The effect of pH on zinc phosphate coating morphology and its corrosion resistance on mild steel

Abstract

Zinc phosphate coating is commonly used for corrosion protection of metallic materials, mainly mild steel. In this study, influence of the pH of phosphating bath on the surface morphology and corrosion resistance of zinc phosphate coatings on mild steel was investigated. The phosphate layers were deposited on steel from phosphating bath at different pH values (1.75 ~ 2.75). The surface morphology and composition of phosphate coatings were investigated via scanning electron microscopy (SEM), and energy-dispersive X-ray (EDX). The corrosion resistance of the coating was evaluated by polarization curves (anodic and cathodic) in an aerated 3.5% NaCl solution. The results showed that better surface coverage and corrosion resistance for the steel phosphated at pH 2.75.