

Communication

# Characterization of zinc phosphate coatings: influence of the pH and temperature in morphology and corrosion resistance

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**Abstracts:** Zinc phosphate coatings are commonly used to protect high-strength steel rods and improve the corrosion protection ability. The temperature and the pH of the phosphating bath are important parameters that affect to the film appearance, porosity, and composition.

In this work, some variations in the phosphating solution have been analysed. In particular, the temperatures were modified in the range 50-75 °C and the pH values were fixed to 2.4, 2.8 and 3. Phosphate coatings were investigated via Scanning Electron Microscopy (SEM) and Energy Dispersive X-ray (EDX) that allow a complete surface analysis, including both the morphology and the composition. The coatings mass was also determined by the gravimetric method. For the corrosion resistance of the film, the linear polarization curves obtained in Na<sub>2</sub>SO<sub>4</sub> 0.1 M were analyzed.

The results show the phosphating baths at 60-65°C and pH at 2.44 produce a thicker film, with the highest amount of Zn and an improved corrosion resistance.

**Keywords:** phosphate; corrosion; SEM

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