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**A facile synthesis method of an effective anti-corrosion nanopigment based on zinc polyphosphate through microwaves assisted combustion method; Comparing the influence of nanopigment and conventional zinc phosphate on the anti-corrosion properties of an epoxy coating**

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**Abstract:** In this study zinc polyphosphate nanopowder (ZnPP NP) was synthesized through microwaves assisted combustion method. By Fourier Transform Infrared (spectroscopy) (FT-IR) and X-ray diffraction (XRD) analysis the chemistry and by field-emission scanning electron microscopy (FE-SEM) coupled with energy dispersive spectroscopy (EDS) the morphology of the ZnPP NP were investigated. Potentiodynamic polarization, electrochemical noise (EN) and electrochemical impedance spectroscopy results confirmed the high inhibition efficiency of about 94% for the mild steel sample exposed to the extract of ZnPP NP. Incorporation of ZnPP NP into the epoxy coating enhanced its corrosion protection performance much greater than the conventional zinc phosphate.

**Keywords:** Zinc polyphosphate nanopowders; Corrosion; FT-IR; FE-SEM; EIS

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