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Novel Nano Corrosion Inhibitor, Integrated Zinc Titanate Nano Particles: Synthesis, Characterization, Thermodynamic and Electrochemical Studies

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Abstract

A novel corrosion inhibitor named integrated zinc titanate nano particles ($ZnTiO_3$) has been reported along with its synthesis and physico-chemical characterization studies like Scanning Electron Microscopy (SEM), Energy Dispersive Spectroscopy (EDX) and Fourier Transform Infrared Spectroscopy (FTIR). Thermodynamic parameters i.e., Mass loss, Langmuir adsorption and effect of temperature have been explored and observed the significant enhancement in corrosion inhibition efficiency with increasing doses of the synthesized inhibitor. However, on elevated temperatures, corrosion efficiency has been found in decreasing manner. The synthesized material has been tested for its corrosion inhibition efficiency on mild steel (MS) in HCl medium using Electrochemical methods like Potentiodynamic Polarization and Electrochemical Impedance Spectroscopic (EIS) studies. Studies revealed that it is an efficient corrosion inhibitor showing cathodic type of inhibition activity on MS.

Keywords:

Zinc titanate, Nano corrosion inhibitor, Mild steel, Corrosion inhibition efficiency, electrochemical studies

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