



Poly (acrylic acid) and Sodium gluconate as effective corrosion inhibitors for mild steel in chloride environment

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Abstract : The aim of the present work was to study the corrosion inhibition of mild steel using a ternary formulation. This new ternary inhibitor formulation, viz., Polyacrylic acid (PAA), with nickel ions and Sodium gluconate (SG) was used to protect mild steel from corrosion in a low-chloride environment. The weight loss studies showed that 89% inhibition efficiency was achieved with the ternary system consisting of 50 ppm Ni²⁺ ions, 200 ppm PAA, and 600 ppm SG. Electrochemical methods (potentiostatic polarization and electrochemical impedance studies) and Surface characterization techniques (FT-IR, SEM, EDAX and AFM) are also used to ascertain the nature of the protective film. The mechanical aspect of corrosion inhibition is proposed.

Keywords : Mild steel, Polarization, EIS, FT-IR, SEM, EDAX, AFM.

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