Synergistic Inhibition Effect of Sodium Tungstate and Zinc Sulphate on Mild Steel Corrosion in Seawater

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The desirable concentrations of sodium tungstate (ST) along with zinc sulfate (ZS) were selected for mild steel in seawater, and the inhibition effect of ST and ZS under wet/dry cyclic condition was investigated using weight loss and electrochemical methods. Results showed that the inhibition efficiency could reach 84.81% after 10 wet/dry cycles. Corrosion products were observed and analyzed by scanning electron microscopy (SEM) and X-ray diffraction (XRD). Corrosion behaviours under different wet/dry ratios were studied, which showed that the longer drying time was, the more serious corrosion was. The inhibition mechanism was that Fe_2WO_6 attached to the steel surface and retarded the corrosion reaction.

Keywords: Corrosion inhibition; Synergistic effect; Mild steel; EIS; Weight loss.

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