



Corrosion Inhibition for industrial applications

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ABSTRACT

Corrosion is defined as destruction of the material by chemical or electrochemical attack because of reaction with its environment.

The aim of this research is to study the effectiveness of potassium thiocyanate (KSCN), which is considered to be inorganic corrosion inhibitor in controlling corrosion of steel and copper. The experimental techniques used in the present investigation, which includes: weight loss, potentiodynamic polarization and electrochemical impedance spectroscopy (EIS) techniques for corrosion measurements. The inhibition efficiency of different concentrations of KSCN has been studied for the corrosion of mild steel and copper in 1 M HCl and 0.5 M H₂SO₄. The results obtained showed that this compound is an inorganic type inhibitor with high effectiveness. The effect of temperature on the corrosion behavior with the addition of KSCN was studied in the temperature range 298–303 K. There is a good agreement between the values of inhibition efficiency of the KSCN concentrations obtained using the three techniques. Potentiodynamic polarization curves showed that KSCN act as mixed-type inhibitors for the corrosion of mild steel in both 0.5 M H₂SO₄ and 1 M HCl solution but act as cathodic-type inhibitor for the corrosion of copper in 0.5 M H₂SO₄ solution. The Nyquist impedance plots showed that the size of semicircle increases with increasing concentrations of KSCN confirming that the KSCN act as inhibitors for the corrosion of mild steel and copper in both 0.5 M H₂SO₄ and 1 M HCl.