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Investigation of corrosion inhibitors performance for protection of metals by electrochemical methods

M. Behpour, N. Mohammadi

Department of Analytical Chemistry, Faculty of Chemistry, University of Kashan, Kashan, I. R. Iran

Metals are widely used in store tanks, petroleum refineries, and industry. The main problem of using metal is its dissolution in acidic solutions [1]. Acid solution is widely used for removal of undesirable scale and rust in many industrial processes [2]. Inhibitors are generally used in these processes to control the metal dissolution [3-5]. Potentiodynamic polarization measurements, electrochemical impedance spectroscopy, weight loss measurements, quantum chemical method, scanning electron microscopy and atomic force microscopy are best methods for investigation of inhibitors. Electrochemical methods are useful and quick methods for corrosion investigations. Potentiodynamic polarization measurements can suggest that the inhibition has a mixed type, anodic or cathodic nature. The corrosion potential (E_{corr}), corrosion current density (i_{corr}), anodic Tafel slope (b_a) and cathodic Tafel slope (b_c) deduced from the Tafel curves. Impedance measurements show best equivalent circuit. obtained information from Nyquist plots are consists of charge-transfer resistance (R_{ct}), double layer capacitance (C_{dl}), and solution resistance (R_s). The electrochemical methods have this ability define type of adsorption of inhibitors by investigation of concentration and temperature.

References

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