



Surface Modification of Carbon Steel by Hexanesulphonic Acid- Ni²⁺ System and its Corrosion Study

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Abstract: Corrosion inhibition has become an important area of research because, corrosion cannot be prevented but it can be controlled. The topic corrosion is inter-disciplinary and it includes all the basic sciences, such as physics, chemistry, biology and all the disciplines of engineering, such as civil, mechanical, electrical and metallurgical engineering. The purpose of studying the process of corrosion is to find methods to control it. One approach is the use of corrosion inhibitors. This research is carried out to evaluate the corrosion inhibition behavior of hexanesulphonic acid (HS) along with nickel ion (Ni²⁺) on carbon steel in dam water using weight-loss method. Results of weight loss method indicated inhibition efficiency (IE) increased with increasing inhibitor concentration. Polarization study reveals that HS-Ni²⁺ system controls the anodic reaction predominantly. AC impedance spectra prove that a protective film is formed on the metal surface. The nature of the metal surface has been analyzed by Fourier transform infrared spectroscopy (FTIR), Scanning electron microscopy (SEM) and Energy dispersive x-ray detector (EDAX) measurements.

Keywords -Carbon steel; Corrosion; Electrochemical techniques; FTIR; SEM; EDAX.

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