

Orange Peel Extracts (OPE) as Eco-Friendly Corrosion Inhibitor for Carbon Steel in Produced Oilfield Water

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Abstract : In this work, an attempt is made to study the effects of orange peel extract (OPE) as an environment-friendly corrosion inhibitor for carbon steel (CS) within a formation water solution (FW). The study was performed in different concentrations (0.5-2.5% (v/v)) of peel extracts at ambient temperatures (25oC) and (2.5% (v/v)) at temperature range (25- 55 oC) by weight loss measurements, open circuit potential, potentiodynamic polarization and electrochemical impedance. The inhibition efficiency was calculated from all measurements and confirmed by energy-dispersive X-ray spectroscopy (EDS). Inhibition was found to increase with increasing inhibitors concentration and decrease with increasing temperature. It was seen that IE% is about 92.84% in the presence of 2.5% (v/v) of orange peel inhibitor by using weight loss method. The adsorption process was of physical type and obey Langmuir adsorption isotherm. Also, adsorption, as well as the inhibition process, followed first-order kinetics at all concentrations.

Keywords : eco-friendly corrosion inhibitor, OPE, oilfield water, electrochemical impedance

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