Electrochemical Investigations of the Inhibitive Activity of a Pyridazinium Ionic Liquid for the Acid Corrosion of Carbon Steel

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A1-benzylpyridazin-1-ium bromide inhibition of the corrosion of carbon steel in molar hydrochloric acid has been investigated by electrochemical methods. MS20 adsorbed onto both hydrogen reduction and carbon steel dissolution active sites and acted as mixed-type inhibitor. The increasing MS20 concentrations induced increasing surface coverage and inhibition efficiency as concluded from both linear polarization and electrochemical impedance spectroscopy. In the former, a decreasing corrosion current and a positive corrosion potential shift were observed. While, in the latter, it led to an increasing charge transfer resistance and a decreasing double layer capacitance. The formation of a protective film was confirmed by SEM.

Keywords: Carbon steel; Corrosion; Ionic liquids; Linear polarization; Electrochemical impedance spectroscopy; Adsorption.

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