

Flow Accelerated Corrosion Behavior of Low Alloy Steel at Elevated Temperature

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Abstract

Flow accelerated corrosion behavior of piping steel in the range of 25°C to 270°C was studied using Rotating Cylinder Electrode (RCE). Electrochemical corrosion potential (ECP) and electrochemical corrosion current density was measured with temperature and rotating velocity through polarization test. ECP dropped at the rate of $-1.51\text{mV}/^\circ\text{C}$ which is attributed to the formation of magnetite on steel surface. It shifted upward with rotating condition in all temperature range by the diffusion mechanisms of oxidizing agent. It can be discriminated activation between mass transfer process from the comparison between electrochemical corrosion current and deposition current on steel surface