Investigation of Corrosion Behavior of Q235 Steel in Simulated Industrial Wastewater

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Different from the corrosion in the natural seawater, there are many factors influencing the metal corrosion of facilities along the sea entrance. Due to the large amount of anions in industrial wastewater, its discharge has a great influence on the corrosion of port facilities. In this paper, open-circuit potential(E_{ocp}), AC impedance spectroscopy and potentiodynamic polarization curves were used to characterize the corrosion behavior of Q235 steel influenced by three kinds of anions. The concentrations of the anions were set as $[Cl^-]$ 20000mg/L, $[HCO_3^-]$ 200mg/L and $[SO_4^{2-}]$ 3000mg/L, with reference to the maximum value of the industrial wastewater discharged from Yantai sea area. The result showed that at the given concentration, the corrosion of Q235 steel was inhibited in the Cl^- solution, whereas in the HCO_3^- solution and SO_4^{2-} solution, the corrosion was inhibited at first and then promoted later in the experiment.

Keywords: Carbon steel; Industrial wastewater; Corrosion resistance; Seawater environment

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