Short Communication

Influence of Crevice Thickness on Corrosion Behavior of API X80 Steel under Disbonded Coating in Acid Soil Environment

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doi: 10.20964/2021.01.19

Received: 6 August 2020 / *Accepted:* 28 September 2020 / *Published:* 30 November 2020

In this study, an experimental device based on the disbonded coating model for the Yingtan simulated soil solution has been developed. The corrosion behavior of X80 steel was studied by anodic polarization, electrochemical impedance spectroscopy (EIS) and scanning electron microscopy (SEM). The observed findings showed that the anodic polarization demonstrated “passivation” behavior when the crevice thickness was about 35 μm . However, the anodic current density increased and anode active dissolution tendency was sobered to enhance with the thickness. The charge transfer resistance (R_t) achieved the minimum and maximum values at a thickness of 150 μm and 400 μm respectively. The corrosion effects was noted to be serious at a thickness of 150 μm , and the pitting appeared due to the enhanced amounts of O_2 and H^+ migrating in the disbonded area, which was consistent with the findings from EIS.

Keywords: X80 steel, Disbonded coating, Soil environment, Crevice corrosion, Corrosion Behavior

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