Short Communication

Study on Electrochemical Behavior of 20# Carbon Steel with Disbonded Coating by Scanning Kelvin Probe and Local Electrochemical Impedance Spectroscopy

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doi: 10.20964/2020.06.17

Received: 9 February 2020 / *Accepted:* 27 March 2020 / *Published:* 10 May 2020

As oil & gas pipelines are built underneath the earth's surface, corrosion-protecting coatings may produce different kinds of defects that cause from many kinds of factors underneath the soil. After a break or disband occurs in the pipeline coating, crevices form between the coating and the metallic substrate. Corrosive dielectric forms at the crevice and causes crevice corrosion to occur on the metallic substrate. Even worse, crevice corrosion lowers the protective effect of the coating and shortens the life of pipelines; the corrosion can even lead to exploding after the pipelines have perforation leakage. This paper adopted a simulation experiment and theoretical analysis, and promoted the micro-electrochemical behavior associated with the crevice corrosion of pipelines; tests were conducted with coatings containing different defect sizes to study the local corrosion mechanism at the crevice.

Keywords: 20# Carbon Steel; Scanning Kelvin Probe (SKP); Local Electrochemical Impedance Spectroscopy (LEIS); Crevice corrosion

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