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Inhibiting Effects of Zwitterionic Surfactant on the Erosion-Corrosion of API X52 Steel in Oil Sands Slurry

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Abstract : The effect of zwitterionic surfactant (ZS) on erosion-corrosion of API X52 steel in oil sands slurry was studied using Tafel polarization and anodic polarization measurements. The surface morphology of API X52 steel was examined with scanning electron microscopy (SEM) and atomic force microscopy (AFM). ZS inhibited the erosion-corrosion of API X52 steel in oil sands' slurry, and the inhibition efficiency increased with increasing ZS concentration but decreased with increasing temperature. Polarization curves indicate that ZS act as a mixed type of inhibitor. Inhibition efficiencies of ZS in the dynamic condition are not as effective as that obtained in the static condition.

Keywords : corrosion, surfactant, oil sands slurry, erosion-corrosion
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