

Influence of Vanadium on the Corrosion Behavior of High Manganese Steel in 0.5 M H₂SO₄ Solution

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Abstract: The effect of vanadium on the corrosion behavior of high manganese steel in 0.5 M H₂SO₄ solution has been investigated using scanning electron microscopy, potentiodynamic polarization and impedance spectroscopy. The results have shown that the addition of vanadium to high manganese steel decreases the corrosion current density from 2.1 mA cm⁻² to 1.29 mA cm⁻². Impedance diagrams show the existence of a high frequency capacitive loop and a low frequency inductive loop. The addition of vanadium increases charge transfer resistance from 5.18 Ω cm² to 12.45 Ω cm².

Keywords : corrosion, Manganese, EIS, Tafel