Short Communication

Effect of Sulfate and Chloride Ions on Pitting Corrosion Behavior of 2Cr12MoV Steel at pH 6 and 90 °C

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The effect of SO_4^{2-} on the pitting corrosion behavior of 2Cr12MoV Steel in early condensates containing Cl^- was studied by electrochemical measurements, scanning electron microscopy and energy dispersive X-ray spectroscopy. The potentiodynamic polarization results show SO_4^{2-} suppressing the pitting corrosion initiation on 2Cr12MoV steel. Potentiostatic polarization, SEM and EDS analysis results show SO_4^{2-} has effect on suppressed pits initiated by competitive absorption with Cl^- and pits growth by forming low solubility salts with metal ions inside the pits and covered on the pit mouths. The effect of SO_4^{2-} on suppressed pits growth reduced with 10 ppm SO_4^{2-} added into test solution compared to 5 ppm SO_4^{2-} added due to cracks appeared on the corrosion products film, which enabled pit growth to continue.

Keywords: Blade steel, pitting corrosion, SO_4^{2-} , Early condensate

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