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研究报告

饱和 H_2S 对316L不锈钢腐蚀电化学行为的影响

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摘要:

利用极化曲线和电化学阻抗谱(EIS), 结合电化学噪声(EN)技术研究了316L不锈钢在80℃ H_2S -HCl- H_2O 环境下的腐蚀电化学行为, 利用散粒噪声理论并结合统计方法分析了其腐蚀过程及其腐蚀发展趋势。结果表明, 饱和 H_2S 的存在使316L不锈钢的钝化区消失, 加速了腐蚀; 使钢腐蚀的频率加大, 且更容易产生严重的腐蚀。

关键词: 316L不锈钢 H_2S 腐蚀 电化学噪声

INFLUENCE OF SATURATED H_2S ON CORROSION BEHAVIOR OF 316L STAINLESS STEEL

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Abstract:

The corrosion behavior of 316L stainless steel in H_2S -HCl- H_2O environment at 80℃ was investigated by potentiodynamic polarization curves, electrochemical impedance spectroscopy (EIS) and electrochemical noise (EN). The parameters derived from shot noise theory combined stochastic theory had been employed to analyze the corrosion mechanism of 316L stainless steel in H_2S -HCl- H_2O environment at 80℃. The polarization curves of 316L stainless steel indicated that there existed an obvious passivation characteristic without H_2S , and active dissolution with saturated H_2S . The corrosion process of 316L stainless steel was promoted greatly with addition of saturated H_2S . An analysis of the electrochemical noise data based upon the combined stochastic theory and shot-noise theory showed that the characteristic frequency of corrosion of 316L stainless steel were increased and the development of corrosion of 316L stainless steel became much easy with addition of saturated H_2S .

Keywords: 316L stainless steel H_2S corrosion EN

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