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研究报告

月桂酸在CO_2饱和盐水溶液中缓蚀行为和机理研究

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摘要： 用电化学方法和衰减全反射傅立叶红外(ATR-FTIR)技术研究了月桂酸对N80钢在不同pH值(4.9、6.9和7.4)的CO_2饱和盐水溶液中的缓蚀行为和机理。试验结果表明月桂酸在低pH值下对阴极反应的抑制作用比较明显；在高pH下，月桂酸对阳极反应的抑制作用比较明显；而在研究的中间pH值，可以同时有效抑制腐蚀过程的阴阳极反应, 呈过渡态的特征。缓蚀剂在不同pH值下不同的吸附状态，使得缓蚀剂与金属表面具有不同的相互作用能力，这也解释了月桂酸分子在不同pH值的溶液中缓蚀行为的差异性。

关键词： 二氧化碳 月桂酸 pH 缓蚀 N80钢

INHIBITION PERFORMANCE AND MECHANISM OF LAURIC ACID IN CO_2 SATURATED NaCl SOLUTION

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Abstract: The inhibition performance of lauric acid on N80 steel in CO_2 saturated NaCl solution at different pH values (4.9, 6.9 and 7.4 respectively) were investigated using electrochemical methods and the attenuated total reflection Fourier-transform infrared (ATR-FTIR). The results showed that lauric acid has more obvious inhibition ability to the cathode process in the lower pH value. While at higher pH value, the inhibition effect is more obvious to the anode process. At the middle pH value, it showed the transition-state characteristics and has the inhibition effect both to anode and cathode processes. The different adsorption state of the inhibitor at various pH values has different interaction with the metal surface which explains the difference of the inhibition performance in the test environments.

Keywords: carbon dioxide lauric acid pH inhibition N80 steel

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