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研究报告

饱和CO₂盐水溶液中咪唑啉缓蚀剂在碳钢表面上的吸附行为

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摘要: 采用动电位极化曲线对咪唑啉缓蚀剂(MA)进行了测试,研究了在饱和CO₂的1% NaCl水溶液中,缓蚀剂在碳钢表面的吸附行为,并计算了吸附反应的热力学参数,探讨了缓蚀剂的吸附模型。结果表明,该缓蚀剂是一种混合抑制型缓蚀剂,其缓蚀率随缓蚀剂浓度($3\times10^{-5}\sim1.5\times10^{-3}\text{mol/L}$)的增加而增加、随温度(30℃~60℃)的升高而降低。缓蚀剂MA在碳钢表面的吸附满足El-Awady等动力学模型,并与Flory-Huggins吸附等温线相吻合。

关键词: 二氧化碳 咪唑啉缓蚀剂 缓蚀率 吸附

ADSORPTION BEHAVIOR OF IMIDAZOLINE INHIBITOR ON CARBON STEEL IN CO₂ SATURATED NaCl SOLUTION

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Abstract: Adsorption behavior of an imidazoline inhibitor (MA) on carbon steel in CO₂ saturated 1% NaCl solution is studied by potentiodynamic polarization curves. The thermodynamic parameters are calculated and the adsorption isotherm is also discussed. The results show that MA is of mixed adsorption and its inhibition efficiencies increased with the increasing of MA concentration and decreased with the increasing of temperature. The adsorption of MA meets the El-Awady thermodynamic kinetic model, and is in line with the Flory-Huggins isotherm.

Keywords: carbon dioxide imidazoline inhibitor inhibition efficiency adsorption

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