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研究报告

碳钢在90℃、H_2S-HCl-H_2O环境下的腐蚀行为 Ⅱ-H_2S溶液中HCl浓度对碳钢腐蚀行为的影响

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摘要： 利用腐蚀失重和电化学测试方法并结合SEM分析技术，研究90℃含有H_2S的模拟炼油厂常减压塔顶冷凝水中不同HCl浓度下碳钢的腐蚀行为。结果表明，HCl有效地促进碳钢的阴极过程，阴极去极化过程随HCl浓度升高而加剧，碳钢腐蚀速率加快。无HCl时，碳钢表面形成大量的腐蚀坑，而有HCl 存在时，电极表面呈现严重的均匀腐蚀。金属表面形成的腐蚀产物为四方硫铁矿。

关键词： 碳钢 HCl H_2S 腐蚀

CORROSION BEHAVIOR OF CARBON STEEL IN H_2S-HCL-H_2O AT 90℃ Ⅱ-The Effect of HCl Concentration on Corrosion Behavior of Carbon Steel in H_2S Solutions

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Abstract: The electrochemical behavior of SAE-1020 carbon steel in acidic simulation solutions containing H_2S with different concentrations of HCl at 90℃ was investigated by mass loss method, electrochemical measurements, SEM observations and XRD. The results indicated that the cathodic depolarization was promoted greatly and the corrosion rate of carbon steel increased remarkably with the increase of HCl concentration in H_2S-containing solutions. Large numbers of corrosion holes formed on carbon steel in H_2S-containing solution without HCl, whereas only the uniform corrosion characteristic was observed on carbon steel surface in the simulation solutions containing different concentrations of HCl. Mackinawite was the sole corrosion product formed on the carbon steel surface in the H_2S-containing solutions with and without HCl.

Keywords: carbon steel hydrogen chloride hydrogen sulfide corrosion

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