

论文

低磷酸盐-低NaOH模拟炉水中20A碳钢的腐蚀

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摘要:

通过高压釜挂片试验,模拟在低磷酸盐-低NaOH工艺下炉水温度、溶解氧、pH值、侵蚀性阴离子Cl⁻、SO₄²⁻对20A碳钢的腐蚀影响,用电子探针二次电子像或背散射电子法、腐蚀产物的X-射线衍射分析及溶液中总铁离子的测定、计算腐蚀速率等方法综合分析评价腐蚀行为.结果表明,温度升高,碳钢的腐蚀速率增大,大于250℃时腐蚀产物为磁性Fe₃O₄,表面膜均匀致密,耐蚀性能好;溶解氧对试片成膜影响较大,腐蚀速率随溶解氧浓度减小而明显下降;炉水pH值控制在9.2~9.6合适;侵蚀性阴离子Cl⁻、SO₄²⁻主要引起点蚀,加速腐蚀,阻碍膜的形成.

关键词: 20A碳钢 低磷酸盐-低NaOH工艺 腐蚀速率

CORROSION OF 20A STEEL IN SOLUTION WITH LOW PHOSPHATE AND LOW NaOH

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Abstract:

The corrosion of 20A steel in boiler water with additive of low phosphate and low NaOH was simulated with an autoclave. The influence of the dissolved oxygen, pH and corrosive anions was investigated. The results indicated that the corrosion rate increased with increasing temperature, and a magnetic scale formed on the surface of 20A steel when the temperature was above 250℃, which can prevent the steel from further corrosion. The dissolved oxygen in water affected the scale forming on the surface, the forming rate decreased rapidly with the decreasing the dissolved oxygen. The optimal pH range of boiler water was 9.2~9.6. The corrosive anions Cl⁻、SO₄²⁻ can interfere with the scale forming, especially cause pitting.

Keywords: 20A steel low phosphate and low NaOH treatment corrosion rate

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