

论文

晶粒尺寸对普碳钢耐工业环境下大气腐蚀性能的影响

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摘要:

用不同轧制及热处理工艺制备了化学成分相同而晶粒尺寸不同的3种普碳钢试样。采周浸、锈层横截面微观分析、交流阻抗测试等手段对晶粒尺寸与普碳钢耐工业环境下大气腐蚀性能之间的规律进行了研究,同时测定了不同晶粒尺寸的普碳钢在10%硫酸溶液中的极化曲线。结果表明,普碳钢晶粒尺寸从50um减小到4um,周浸加速腐蚀试验后锈层中裂纹和空洞的数量也相应减少,耐蚀性能提高;但极化曲线试验表明,晶粒细化可加速普碳钢在10% H2SO4溶液中的腐蚀速度。分析了晶粒尺寸对晶界局部阳极腐蚀电流密度的影响,对其影响耐蚀性的机理进行了讨论。

关键词: 晶粒尺寸 碳钢 晶粒细化 大气腐蚀

Effect of grain size on the atmospheric corrosion resistance of carbon steel in industrial environment

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Abstract:

There kinds of carbon steels of different grain size with the same chemical composition were prepared by different rolling and heat treatment processes.The relationship between grain size and atmospheric corrosion resistance of carbon steel in industrial environment has been investigated by cyclic immersion corrosion test, micro-analysis of rust and electrochemical test, the polarization curves of different grain size steel in 10% H2SO4 solution were also tested. The results showed that the crack and cavity in the rust after cycle immersion corrosion test were decreased and the atmospheric corrosion resistance was increased by grain refinement of carbon steel from 50 μm to 4μm, but the corrosion rate of carbon steel was increased by grain refinement in 10% H2SO4 solution.The effect of grain size on the corrosion current density of local grain boundary was analysed and the mechanics of corrosion was discussed.

Keywords: grain size carbon steel grain refinement atmospheric corrosion resistance

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2. 孟国哲, 李瑛, 王福会 .纳米Fe-10Cr涂层电化学腐蚀行为影响研究 I 钝化性能[J]. 中国腐蚀与防护学报, 2007,27(1): 35-42
3. 孟国哲, 李瑛, 王福会 .纳米Fe-10Cr涂层电化学腐蚀行为影响研究 II 点蚀性能[J]. 中国腐蚀与防护学报, 2007,27(1): 43-47

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