

论文

316L不锈钢微动磨蚀过程表面钝化膜自修复行为研究

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摘要:

采用球平面接触设备,结轧制固溶316L不锈钢在不同NaCl溶液微动过程中,表面钝化膜的自修复行为进行了研究,讨论了溶液腐蚀特性及缝隙腐蚀行为对微动过程的影响.结果表明,溶液腐蚀特性的改变引起材料钝化膜自修复行为的差异,但不显著.在去离子水溶液中,316L不锈钢表面钝化膜保持了较高的自修复能力,稳定阶段表面钝化膜自修复约占平衡态下钝化膜厚度的17%,说明316L不锈钢表面钝化膜在微动过程并不能长期有效地保护材料免受腐蚀损伤.

关键词: 微动 316L不锈钢 钝化膜自修复行为

REPASSIVATION BEHAVIOR of 316L STAINLESS STEEL IN FRETTING WEAR AND CORROSION PROCESS

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Abstract:

Repassivation behavior behavior of 316L stainless steel in fretting has been studied in different NaCl solutions. And the effect of crevice corrosion occurring during fretting process had been discussed. The results showed that different solutions resulted in different repassivation behavior. But the difference of repassivation behaviors in different solutions was not remarkable: in pH10.0(0.9% NaCl) solution, repassivating process could last for about 5×10⁴ cycles; while fretting in other corrosive solutions, no more repassivation process took place after 4×10⁴ cycles. When fretting was carried out in deionized water the material had better repassivation ability. The growing film might take up 17 percent of passive film in static condition. The evidence suggested that passive film could not protect the material from corrosion damage effectively in fretting

Keywords: fretting 316L stainless steel repassivation behavior of passive film

收稿日期 1999-11-08 修回日期 1900-01-01 网络版发布日期 2000-12-25

DOI:

基金项目:

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