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研究报告

高氮钢和321不锈钢的冲刷腐蚀行为

乔岩欣[1,2],刘飞华[1],任爱[1],姜胜利[2],郑玉贵[2]

1. 苏州热工研究院有限公司 苏州 215004
2. 中国科学院金属研究所 金属腐蚀与防护国家重点实验室 沈阳 110016

摘要： 用喷射式冲刷腐蚀实验研究了高氮奥氏体不锈钢和商用321不锈钢在含砂介质中的冲刷腐蚀行为，并计算了其在冲刷腐蚀条件下的力学和腐蚀交互作用分量。在单相NaCl溶液中静态条件下，高氮钢的耐蚀性能高于321不锈钢，在双相流介质中高氮钢的抗冲刷腐蚀能力亦高于321不锈钢。冲刷腐蚀不但加速了溶液中氧的传质过程，还破坏了不锈钢表面的钝化膜，使不锈钢处于活性溶解状态，以致电化学腐蚀速率增大两个数量级。交互作用中纯力学作用所占的比重最大。

关键词： 高氮不锈钢 冲刷腐蚀 极化曲线 交互作用

EROSION-CORROSION BEHAVIOR OF HIGH NITROGEN STAINLESS STEEL AND COMMERICAL 321 STAINLESS STEEL

QIAO Yanxin[1,2], LIU Feihua[1], REN Ai[1], JIANG Shengli[2], ZHENG Yugui[2]

1. Suzhou Nuclear Power Research Institute, Suzhou 215004
2. State Key Laboratory for Corrosion and Protection, Institute of Metal Research, Chinese Academy of Sciences, Shenyang 110016

Abstract: The erosion-corrosion behavior of high nitrogen stainless steel and commercial 321 stainless steel in slurry flow was investigated by using a high-speed jet impingement erosion-corrosion apparatus. Meanwhile, the mass loss caused by erosion and corrosion and synergistic of corrosion and erosion was calculated. Compared to commercial 321 stainless steel, high nitrogen stainless steel has relatively superior corrosion resistance both in static NaCl solution and slurry flow. Erosion not only accelerated the traction of oxygen but also damaged the passive film formed on stainless steel. The damage of the passive film resulted in an active dissolution state and induced the corrosion current density increasing 100 times more than that in static solution. The mass loss caused by pure erosion was the dominant factor in total mass loss.

Keywords: high nitrogen stainless steel erosion-corrosion potentiodynamic polarization curves synergisticeffect

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通讯作者: 乔岩欣qiaoyanxin@cgnpc.com.cn

作者简介: 乔岩欣，1980年生，男，博士，高级工程师，研究方向为材料腐蚀与防护

通讯作者E-mail: qiaoyanxin@cgnpc.com.cn

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