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论文

水环境中焊接件腐蚀电化学传感器的研制

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摘要：

研制了一种可用于检测水环境中焊接件焊缝与母材不同部位腐蚀状况的电化学传感器，分别设计了适合对接和角接焊缝腐蚀检测的两种传感器。运用局部封闭原理，测试时传感器与待测构件表面形成临时封闭的电解池。利用磁铁将传感器固定在待测件表面。实验验证了封闭电流的能力。并应用所研制的传感器对3.5%NaCl溶液中模拟焊接试样的焊缝及母材不同部位进行了测试。结果表明，焊缝和母材的极化阻力随时间呈现出不同的变化规律。EIS测试结果也存在明显的区别。结果表明，研制的传感器可以很好地区分出焊接件不同部位的腐蚀状况。

关键词： 焊接件 电化学传感器 腐蚀检测

Corrosion Electrochemical Sensor for Welded Structures in Aquatic Environment

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Abstract:

In this paper, an electrochemical sensor to detect corrosion in aquatic environment was designed and set up.But contact and angular contact welding seam corrosio detection sensors were designed respectively. Based on local enclosure theory an enclosed electrolytic cell was built up by contacting the front section of insulated cavity with the surface of the component to be tested. Magnets were employed as contacting fix up on the structre surface. Current enclosing capability of the sensor was erified by the experiments. Employing the sensor developed, measurement were carried out at welding seam and different locations of the base metal on simulating welded specimens in NaCl solution of 3.5%. The results show that Rpof welding seam and base metal exhibit different trends against time, and both EIS spectrums diferentiate with each other evidently. It shows that the corrosion situations at different sections can be well distinguished by the sensor.

Keywords: welded structure electrochemical sensor corrosion detection

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