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研究报告

静水压力下Q235钢环氧涂层在3.5%NaCl溶液中的失效过程

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摘要: 利用电化学阻抗谱(EIS)研究了一种适用于深海环境的重防护环氧涂料在3.5%NaCl溶液中常压以及3.5 MPa下的破坏机制,探讨了静水压力对涂层失效过程的影响。结果表明,静水压力加速了电解质溶液在涂层中的渗透,对涂层的失效过程有着明显的影响。与常压下相比,静水压力下涂层电阻更小,涂层的失效过程更快;涂层/金属界面的电荷转移电阻更小,界面处金属腐蚀反应更快,涂层下金属基体更容易发生腐蚀,涂层的防护性能变差。

关键词: 涂料 静水压力 电化学阻抗谱 失效过程

EFFECT OF HYDROSTATIC PRESSURE OF 3.5%NaCl SOLUTION ON THE CORROSION BEHAVIOR OF EPOXY COATING

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Abstract: The effect of hydrostatic pressures of 3.5%NaCl solution on the corrosion resistance of the epoxy coating was studied by using electrochemical impedance spectroscopy (EIS). The results revealed that the hydrostatic pressure greatly affected the failure process of the coating. The diffusion rate of the electrolyte solution through the coatings was accelerated in the solution under high hydrostatic pressure. Compared with the case under atmospheric pressure, the coating resistance was reduced; the charge-transfer resistance was decreased, metal corrosion reaction was more accelerated; the protection properties of the coating was deteriorated.

Keywords: epoxy coating hydrostatic pressure EIS degradation

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