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Mapping of Local Corrosion Behavior of Zinc in Substitute Ocean Water at Its Initial Stages by SVET

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The recent advent of a number of local probe techniques is greatly contributing to overcome some limitations when applied to the investigation of corrosion processes *in situ*. The scanning vibrating electrode technique is one of them, and it is based upon the measurement of potential field distributions in the electrolyte surrounding an electrochemically-active surface. The localized distributions of anodic and cathodic activities on zinc metal/electrolyte interface, exposed to substitute ocean water (diluted 1:1000), have been mapped in situ using SVET. The data provide in situ information on the local ionic fluxes produced in the electrolyte as result of the electrochemical corrosion reactions that occurred on the zinc surface, even in the first hours of the process. The maps demonstrated the evolution of the corrosion process, since the nucleation and propagation of corroding pits on the metal. The time evolution of the maps allows to more adequately characterize the complex chemical process involved in zinc corrosion in sea-water with high spatial resolution.

Keywords: SVET, zinc, corrosion, substitute ocean water.

FULL TEXT