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Full Papers

Electrochemical Noise Analysis and Electrochemical Impedance Spectroscopy for Pure Copper in Chloride Media

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摘要 The corrosion behavior of pure copper electrode exposed to artificial seawater has been studied using electrochemical noise analysis (ENA) and electrochemical impedance spectroscopy (EIS). A diffusion process was observed for copper exposed to chloride media as indicated by the presence of a minimum phase angle over the lowest frequency range in the impedance plots. Analysis of electrochemical noise (EN) data has been collected both in time and frequency domains. Noise resistance R_n was obtained after analyzing EN data in the time domain. A good agreement was observed between R_n values and polarization resistance R_p values obtained from EIS analysis. Localization index I_l was not found to provide information concerning corrosion mechanisms. Also skewness and kurtosis for both potential and current fluctuations did not show any mechanistic information. It was concluded that ENA could detect the corrosion rate for copper exposed to chloride media, but was not found to provide information about the corrosion mechanisms.

关键词 impedance noise analysis copper chloride media

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Key words impedance noise analysis copper chloride media

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