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البحث الاول

Effect of nickel content on the electrochemical behavior of Cu–Al–Ni alloys in chloride free neutral solutions

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Abstract

The electrochemical behavior of Cu–Al–Ni alloys in chloride free neutral solutions was investigated. The effect of Ni content on the corrosion resistance of the alloys was examined and evaluated. Conventional electrochemical techniques and electrochemical impedance spectroscopy, EIS, have been used. Potentiodynamic measurements revealed that the increase in the Ni content decreases the stability of the Cu–Al–Ni alloys. The polarization measurements were confirmed by EIS experiments. The morphology of the alloy surface was investigated by scanning electron microscopy, SEM, and surface analysis was made by energy dispersive X-ray technique. The experimental impedance data were fitted to theoretical data according to a proposed equivalent circuit model representing the electrode/electrolyte interface. The results of these experiments are discussed in reference to the potential–pH (Pourbaix) diagrams of the alloying elements.