Short Communication

Electrochemical Impedance Studies on the Corrosion of Cu-35Ni-10Al Alloy in a Molten (0.62Li, 0.38K)₂CO₃ Environment

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Cu alloy is an anode material that can act as an alternative to Ni alloy in molten carbonate fuel cells (MCFCs) because of its thermodynamic stability in the anode gas atmosphere and its lower cost. To evaluate its potential application as an anode material for MCFCs, the high-temperature corrosion behaviour of cast Cu-35Ni-10Al alloy was studied in molten (0.62Li, 0.38K)₂CO₃ at 650°C in air by electrochemical impedance spectroscopy. An equivalent circuit is proposed to fit the impedance spectroscopy results. The values of R_t decreased with the immersion time, suggesting an enhanced corrosion rate. A porous and layered scale formed on the alloy after immersion for 48 h in the melt. Internal oxidation was observed in the Cu-rich zone of the alloy.

Keywords: Cu-35Ni-10Al alloy; Molten carbonate fuel cell; Anode; Corrosion; Electrochemical impedance spectroscopy

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