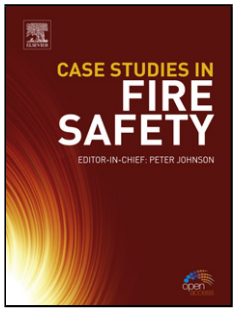

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Dealloying kinetics and mechanism of porosity evolution in mechanically alloyed $Ag_{25}Zn_{75}$ powder particles

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Highlights

1. The kinetics and mechanism of dealloying of Ag-Zn alloy powder were studied.
2. The pore formation is controlled by Zn dissolution from the alloy.
3. Coarsening is controlled by diffusion of Ag atom on alloy/electrolyte interface.
4. Ag rearrangement was the rate controlling phenomenon for the overall dealloying.

Abstract:

The mechanism and kinetics of dealloying of mechanically alloyed $Ag_{25}Zn_{75}$ powder particles was investigated at four different temperatures under free corrosion conditions in freely aerated 2N HCl. The activation energies of 30.65±2.08 kJ/mole and 41.51±3.30 kJ/mole, corresponding to the dissolution of Zn and pore coarsening, respectively, were obtained. The pore formation is controlled by Zn dissolution from the alloy and coarsening is controlled by diffusion of Ag atoms on the alloy/electrolyte interface. Ag rearrangement was found to be the rate controlling phenomenon for the overall dealloying.

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