

Microstructure Control in Sn-0.7mass%Cu Alloys

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Abstract

Soldering alloys based on the Sn-Cu alloy system are amongst the most favorable lead-free alternative due to a range of attractive properties. Trace additions of Ni have been found to significantly improve the soldering characteristics of these alloys (reduced bridges etc.). This paper examines the mechanisms underlying the improvement in soldering properties of Sn-0.7mass%Cu eutectic alloys modified with concentrations of Ni ranging from 0 to 1000 ppm. The alloys were investigated by thermal analysis during solidification, as well as optical/SEM microanalyses of fully solidified samples quenched during solidification. It is concluded that Ni additions dramatically alter the nucleation patterns and solidification behavior of the Sn-Cu₆Sn₅ eutectic and that these changes are related to the superior soldering characteristics of the Ni-modified Sn-0.7mass%Cu alloys.

The paper is available below.

<http://wwwsoc.nii.ac.jp/jim/index-e.shtml>