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The Influence of 0-0.1wt.% Ni on the Microstructure and Fluidity Length of Sn-0.7Cu-xNi

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Abstract

Alloys based on the Sn-0.7Cu-xNi system are potential Pb-free solders. In this paper we report on the solidification characteristics and microstructures of Sn-0.7Cu alloys containing 0-1,000 ppm nickel. The macrostructural observations show that increasing the nickel content reduces the volume fraction of primary Sn, thus generating a more-eutectic microstructure. In an attempt to better understand the changes in solderability with Ni additions, fluidity tests were carried out using the Ragone method for small incremental increase in nickel content. The maximum fluidity length was found to vary strongly with nickel content. Additionally, the distribution of nickel within samples was investigated using synchrotron micro X-ray fluorescence.

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