

Application of artificial neural network for optimization the wet contact angle for lead free Bi-Ag soldering alloys

ABSTRACT

In recent years, electronic packaging provides significant research and development challenges across multiple disciplines such as performance, materials, reliability, thermals and interconnections. New technologies and techniques frequently adopted can be implemented in soldering alloys of semiconductor sectors in terms of optimization. Wet contact angle or wettability of solder alloys is one of the important factors which have got the attention of scholars. Hence, in this study due to the significant similarity over classical solder alloys (Pb-Sn), Bi-Ag solder was investigated. The data was collected through the effect of aging time variation and different weight percentage of Ag in the solder alloys. The contact angle of the alloys with Cu plate is measured by optical microscopy. Artificial neural networks (ANNs) and SPSS were applied on extracted data in order to conduct simulations. The result from experiments and simulations show that the coefficient of determination (R^2) is around 0.97 which signifies that the ANNs set up was appropriate.

Keyword: Lead-free soldering alloy; Wetting angle; Bi-Ag alloy; Artificial neural networks