

RARE EARTH ADDITION EFFECT ON MICROSTRUCTURE AND INTERMETALLIC LAYER GROWTH KINETICS ON LEAD-FREE SOLDER SN-AG-BI

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In an Sn-Ag-Bi alloy were added rare earth (Nd, Pr) in order to determine their effect on the growth kinetics of the intermetallic layer of tin-copper. There were prepared 3 different alloys: Sn-Ag-Bi as a reference, Sn-Ag-Bi + Nd, and Sn-Ag-Bi + Pr. These alloys were applied to a copper substrate, and were given the aging heat treatment at temperatures of 50, 100, 120, and 150 ° C at different residence times (0, 50, 150, and 250 hours) in order to determine the kinetics of intermetallic layer growth of tin-copper, and to determine the evolution of the microstructure of the solder. The soldered samples were prepared metallographically to measure the intermetallic layer thickness of tin-copper, and to monitor the microstructure as a function of temperature and time of heat treatment, using optical and scanning electron microscopy. The thickness of the intermetallic layer increased with increasing temperature and time of heat treatment, while the microstructure was swelling with increasing temperature and time of applied heat treatment.