

ε PHASE DETECTION IN Sn-4Ag-0.7Cu AND Sn-4Ag SOLDER JOINTS USING AUGER ELECTRONS SPECTROSCOPY MICROPROBE

Nir Kedem, Adin Stern, Yair Rosenthal

Materials Engineering Department, Ben Gurion University, Beer Sheva, Israel
ryair@012.net.il

ABSTRACT

Morphology and the chemical composition of the interface layers connecting the high-purity copper substrate with the bulk solder were investigated. Exploration of the sub-micron scale down to 100 nm thick intermetallic layers has been carried out using an Auger Electrons Spectroscopy (AES) microprobe. Examination of the substrate/solder interface with the high-resolution Auger microprobe, revealed the existence of a well defined 380nm thick ε phase (Cu_3Sn) intermetallic layer between the copper substrate and the η phase (Cu_6Sn_5) intermetallic layer in the solder alloys.

KEYWORDS: Lead Free Solders; Intermetallic Compounds; Auger Electrons Spectroscopy.

REFERENCES

- [1] W.K. Choi, S.K. Kang, D.-Y. Shih, J. Elect. Mat. 31 (2002)1283.
- [2] K.N. Tu, A.M. Gusak, M. Li, J., App. Phys. 93 (2003) 1335.
- [3] T Laurila, V. Vuorinen, J.K. Kivilahti, Mat. Sci. Eng. R49 (2005)1.
- [4] S.K. Kang, P. A. Lauro, D.-Y. Shih, D. W. Henderson, K. J. Puttlitz, IBM J. Res.&Dev. 49 (2005) 607.
- [5] D.Q. Yu, L. Wang, J. Alloys Compd. 458 (2008) 542.
- [6] K.H. Prakash, T. Srinivasan, Acta Mater. 49 (2001) 2481.
- [7] R.A. Lord, A. Umantsev, J. App. Phys. 98 (2005) 63525
- [8] R.A. Gagliano, M.E. Fine, JOM 53 (2001) 33.
- [9] L. Garner *et al*, Intel Technology J. 9 (2005) 297.
- [10] Y. Rosenthal *et al*, J. Test. Eval. 36 (2008) 417.