Characterisation of a new Al-Cu-Ge-Mg Phase by HRSTEM and Electron Diffraction

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A hitherto unknown phase containing aluminium, copper, germanium and magnesium was discovered within a recent study on a newly developed system for transient liquid phase bonding of Sn75Cu20Ge (wt-%) brazing material on aluminium cast alloy AlSi7Mg0.3 (wt-%) [1]. Electron diffraction patterns from this phase are compatible with a primitive hexagonal unit cell with approximate lattice parameters a = 0.7123 nm, c = 2.40 nm. Although several structures with large c-axis have been reported for related metal systems, none of these matched with the geometry of our experimental diffraction data. Here we report about further investigations on this new phase employing HRSTEM and element mapping by EDX [2].

[1] Iskandar et al., Mat.-wiss. u. Werkstofftech. 2017, 48, 1257 - 1263, DOI 10.1002/mawe.201700155

[2] Ernst Ruska-Centre for Microscopy and Spectroscopy with Electrons (ER-C) et al. (2016). FEI Titan G2 80-200 CREWLEY. *Journal of large-scale research facilities, 2*, A43

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