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Abstract:

Microalloying trace elements into aluminium alloys have been shown to improve mechanical properties by altering the precipitation process. Here, trace amounts of Sn and (Sn+Ag) have been added to Al-1.1Cu-1.7Mg (at. %) and the effects have been investigated by a combination of hardness testing and transmission electron microscopy (TEM). Hardness testing shows that the addition of Sn increases the hardness throughout the ageing process, and in combination with Ag, further increases the hardness and shortens the time to reach the peak hardness. The increase in hardness via Sn microalloying is attributed to the homogeneous distribution of S phase (Al_2CuMg) precipitates. In the alloy microalloyed with both Sn and Ag, the microstructure is dominated by homogeneously distributed Ω phase (Al_2Cu) precipitates in the peak strengthened condition. Given that neither spherical β-Sn precipitates, nor any other obvious nucleation sites for the Ω phase precipitates were