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Electron Microscope Observations on Rapidly Cast Al-Mn Alloys*

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Abstract

An electron microscope observation was conducted on the cell structure of cast Al-Mn alloys in the composition range between 0.1 and 6 wt%Mn. Solidification and cooling rates were high enough to keep nearly all Mn in supersaturated solid solution for all alloys. At concentrations of 0.5% Mn and higher, dislocation arrays were observed along the cell boundaries, while at nodal points small second phase particles could be detected. In general the nature of cell boundaries did not change decisively over the whole composition range investigated, although some changes in the degree of dislocation alignment and the frequency of second phase particles were noticed. Dislocation densities were low in all alloys. This finding is correlated to low microsegregation at the cell boundaries as observed by microprobe analysis.

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