Nucleation in Al Alloys Processed by MCDC Casting

A.K. Prasada Rao

ABSTRACT

Present work confines itself to discuss the mechanism responsible for the grain refinement of the melt conditioned direct-chill cast aluminum alloys. It has been found that the Al alloys processed by this process undergo grain refinement irrespective of their chemical composition. The forced convection caused during this process led to dendrite fragmentation which enhances the heterogeneous nucleation and result in grain refinement. It is suggested that owing to their favorable lattice matching with α-Al, these fragments serve as potent nuclei for α-Al grains.

KEYWORDS: Dendrite fragmentation; Direct-chill casting; Nucleation, Solidification

DOI: 10.1007/s11665-015-1463-8