

Microstructural study and differential scanning calorimetry analysis at elevated temperatures of superheated AS-CAST A357 alloy

The microstructure of superheated as-cast A357 alloy has been analysed to study the solidification structures of α -Al dendrites, eutectic Si particles and intermetallic compounds at different sections of the specimen. The primary dendritic arms are broken to globular and spherical shaped of α -Al dendrites due to the thermal effect of superheating thermal treatment. Differential scanning calorimetry showed faster formation of endothermic peaks of superheated as-cast A357 alloy relatively also believed to be attributed by superheating thermal treatment. The solidification sequence of superheated A357 alloy was same as Sr modified Al7Si-Mg alloy [4] except for the reaction involving Al_5FeSi intermetallic compound which started with $\text{Liq.} \rightarrow \text{Al}$ dendrites followed by $\text{Liq.} \rightarrow \text{Al} + \text{Si}$ and lastly $\text{Liq.} \rightarrow \text{Al} + \text{Si} + \text{Mg}_2\text{Si} + \text{Al}_8\text{FeMg}_3\text{Si}_6$.