

Production and solidification analysis of titanium carbide particulates reinforced aluminium alloy matrix composite by vortex mixing - sand casting technique

ABSTRACT

In this study, production and solidification analysis of metal matrix composite (MMC) consisting of titanium carbide particulates reinforced aluminium-11.8% silicon alloy matrix are done. A combination of vortex mixing - sand casting technique is used as the manufacturing method to produce the specimens. Thermal measurement during the casting process is captured and solidification graphs are plotted to represent the solidification characteristic. The result shows that as volume fraction of particulates reinforcement is increased, solidification time becomes faster. Particulates reinforcement promotes solidification which will support finer grain size of the casting specimen and in turn produce better mechanical property. Hardness test is performed and it confirms that hardness number increases as more particulates are added to the MMC system.

Keyword: Metal matrix composite (MMC); Vortex mixing; Sand casting; Solidification analysis; Hardness