

FABRICATION OF ALUMINIUM METAL MATRIX REINFORCED WITH TiO₂ AND FLY-ASH BY USING POWDER METALLURGY

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ABSTRACT

Metal matrix Composite materials in general are well known engineering materials with most of them possessing the compensation of higher specific weight, specific modulus and also better thermal stability, fatigue properties and wear resistance, compared to various of metals and alloys. the present work is aimed at improving the mechanical properties of Aluminium alloy Al6061 where consequences of an experimental study of effect of Fly-ash (5-15)% and TiO₂ (2- 6)% in different proportion used as reinforcement with base metal Al6061 composites are prepared by powder metallurgy technique where fly-ash due to its excellent fluidity and good processibility of filled materials using as reinforcement generally improves the hardness, compressive strength and high temperature properties of the materials. Fly-ash used here size was 75micron meter and was seen that compressive strength decreases beyond increase in 5% Fly-ash and 2% TiO₂, hardness was found to be maximum at 5% of Fly-ash and 6% of TiO₂ at 650 degree Celsius and surface roughness was minimum not more than 2 Ra. A theoretical model was also generated for hardness, compression strength and surface roughness using RSM. Powder metallurgy is an idol method of fabrications of MMC's because of the ability to produce near neat shapes and little material waste associated with this process. In this survey, an attempt has been made to consolidate some of the aspects of mechanical properties of Aluminium MMC's fabricated using power metallurgy technique.

Keywords: Aluminium metal matrix composites, Reinforcement Binder, Powder metallurgy, Mechanical properties, Microstructure

