



Fabrication and Study of Titanium Diboride Powder and Aluminium Titanium Alloy Composite

Manabhanjan Sahoo¹, Dipti Ranjan Patra², Ivan Sunit Rout³

Assistant Professor, Department of Mechanical Engineering, C.V.Raman College of Engineering, Bhubaneswar, India ^{1,2,3}

Abstract Aluminium alloy Metal Matrix Composites (MMCs) are gaining wide spread acceptance for automobile, industrial, and aerospace applications because of their low density, high strength and good structural rigidity. In this study aluminum alloy (Al-7Si)/Titanium Diboride (60% pure) reinforced metal-matrix composites (MMCs) are fabricated by melt-stirring technique in two ways; direct cast method and cooling slope method. The Titanium Diboride (TiB_2) powder used in the fabrication of the composite was prepared by heating a mixture of Titanium dioxide (TiO_2), Boron Trioxide (B_2O_3) and charcoal in their stoichiometric ratios in an extended arc thermal plasma reactor using graphite electrode in presence of flowing argon atmosphere. Microstructure and hardness of aluminium alloy (Al-7Si), direct cast composite (Al-7Si-5 TiB_2) and composite (Al-7Si-5 TiB_2) cast through cooling slope method were studied. It was observed that TiB_2 grains are finer and spheroid in shape in the composite casted through cooling slope method which in turn increases the hardness.

Keywords: Matrix Composite, Vicker's Hardness Test, TiB_2

