

Synthesis and Characterization of Aluminum Composites Materials Reinforced with TiC Nano- Particles

Abstract

In this paper, aluminum matrix composites are successfully synthesized by reinforcing various TiC Nano-particles (273.196 nm, 194.732nm, and 149.071 nm). The green compacts of Al-TiC composites were sintered for 3 h at 500, 550, and 600°C. Hardness test and wear test were carried out on the Al-TiC composites. Powders of (Al, and TiC), and composites of (Al-TiC) were characterized using scanning electron microscopy, and X-ray diffraction techniques. Different weight ratios (5%wt, 15%wt, and 25%wt TiC) and different particles size of TiC were used to study the microstructure, and mechanical properties. The results obtained reveal that the densities of sintered composites show a marginal increase with the decrease in the particle size. Al-25wt % TiC composites (particle size 149.07 nm) with 600°C sintering temperature exhibited highest hardness (63.7 HV). Al-25wt % TiC composites with TiC particle size 273.196 nm exhibit the lowest wear rate (0.043 mm³ /s).

Authors: Malek Ali , Samer Falih, (2014), Synthesis and Characterization of Aluminum Composites Materials Reinforced with TiC Nano- Particles, Jordan Journal of Mechanical and Industrial Engineering, Volu. 8 No. 5, pp. 244-250.

<http://jjmie.hu.edu.jo/vol%208-5/JJMIE-111-14-01.pdf>