

Effect of Compaction Load and Sintering Temperature on the Mechanical Properties of the Al-SiC Nano-composite Materials

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Abstract. The development of metal matrix composites (MMCs) has set the stage for a new revolution in materials. In this research, Al matrix composites reinforced with SiC nanoparticles were fabricated by a powder metallurgy process and the effects of compaction load and sintering temperature on the mechanical properties of the Al-SiC nano-composite was investigated. The samples were prepared with two different compaction loads, 100 kN and 200 kN, and two different sintering temperatures, 550 °C and 600 °C. Subsequently, their mechanical testing was carried out. The density and hardness of the samples were investigated. The microstructure of the nano-composite was examined by optical microscope. The results showed that the higher compaction load and higher sintering temperature significantly increased the density and hardness of the nano-composite materials.