

Characteristics of Al/CNT nanocomposites by Mechanical Alloying Process with different raw material via a Planetary ball mill

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Metal matrix and carbon nanotube composites (CNTs) have an enormous potential in advanced applications like aerospace and automotive, lower weight lead to saving energy. Carbon nanotubes are known for their extraordinary mechanical, electrical and thermal properties. The present research reports the successful fabrication of composite materials based on aluminum (Al) particles and CNTs using a planetary ball mill (PBM) technique with an optimized condition. Three different samples, namely un-milled Al, un-milled Al with CNT and milled Al with CNTs, have been used and were further processed using the PBM equipment in the presence of additional CNTs. We investigated changes particle sizes and morphologies of Al/CNT composites using scanning electron microscope (SEM) and field emission scanning electron microscopy (FESEM). After compacting, Al/CNT nanocomposite sintered in a vacuum tube furnace at various sintering conditions, the increased both hardness and electrical conductivity has been observed with optimum sintering condition.

Keywords: Al/CNT nanocomposites, Carbon Nanotube, Planetary ball mill, Sintering