

Fabrication of carbon nanotube reinforced aluminium nanocomposite on different property of raw material by mechanical alloying process using different kinds of ball milling with DEM simulation

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In recent year, much research has been focused on the development of carbon nanotube (CNT) reinforced aluminum (Al) matrix composites, because Al matrix composites have wide prospects of application. The study illustrates the fabrication of Al/CNT nanocomposites on different raw materials which including, un-milled without CNT, un-milled with CNT, milled Al with CNT using a different milling technique. Interactions between aluminum particles and CNTs during mechanical alloying process using traditional ball mill (TBM) and planetary ball mill (PBM) techniques with an optimized condition have been studied. The results were systematically analyzed using scanning electron microscopy, field emission scanning electron microscopy and x-ray diffraction. After compacting, Al/CNT nanocomposite sintered in a vacuum tube furnace at optimal sintering conditions, hardness has been observed. The forces applied to the balls in a TBM and PBM were simulated by the discrete element method (DEM).