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**Strengthening behavior of chopped multi-walled carbon nanotube reinforced aluminum matrix composites**

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**Abstract**

Strengthening behavior of the aluminum composites reinforced with chopped multi-walled carbon nanotubes (MWCNTs) or aluminum carbide formed during annealing at 500 °C has been investigated. The composites were fabricated by hot-rolling the powders which were ball-milled under various conditions. During the early annealing process, aluminum atoms can cluster inside the tube due to the diffusional flow of aluminum atoms into the tube, providing an increase of the strength of the composite. Further annealing induces the formation of the aluminum carbide phase, leading to an overall drop in the strength of the composites. While the strength of the composites can be evaluated according to the rule of mixture, a particle spacing effect can be additionally imparted on the strength of the composites reinforced with the chopped MWCNTs or the corresponding carbides since the reinforcing agents are smaller than the submicron matrix grains.

Keywords: Metal-matrix composites(MMCs); Carbon nanotubes (CNTs); Microstructures; Powder processing.

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