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## Distribution and integrity of carbon nanotubes in carbon nanotube/magnesium composites

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### Abstract

Carbon nanotubes (CNTs) reinforced magnesium matrix composite prepared by an improved process was subjected to extrusion at 350 °C with an extrusion ratio of 20:1. Most CNTs were individually and uniformly dispersed in the as-cast and the as-extruded composite. Moreover, good interfacial bonding was achieved, and Raman spectroscopy showed that the damage to CNTs was insignificant. The addition of CNTs could weaken basal plane texture. Meanwhile, the CNTs evidently improved the ultimate tensile strength, yield strength and Young's modulus of the as-extruded composite. Pulling-out CNTs proved that the length of the CNTs was not large enough to be compatible with the high strength of the CNTs. Grain refinement, load transfer mechanism and Orowan strengthening mechanism play important roles on the increase of the yield strength. The composites fabricated by our process showed the best strengthening efficiency of CNTs

**Keywords:** Carbon nanotubes; Distribution; Integrity; Texture; Magnesium matrix composite.

### 1. Introduction

There has been strong interest in developing lightweight and high-strength

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