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**Effects of graphene content on microstructures and tensile property of
graphene-nanosheets / aluminum composites**

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Abstract:

The graphene nanosheets (GNSs) reinforced Al matrix composites were successfully fabricated by high-energy ball milling and vacuum hot pressing. Effects of graphene content (0.25 wt. %, 0.5 wt. % and 1.0 wt. %) on microstructures and tensile properties of GNSs/Al composites were investigated. Microstructures and the distribution of GNSs were analyzed with scanning electron microscope (SEM), X-ray diffraction (XRD) and transmission electron microscope (TEM). Tensile properties and hardness were studied at room temperature. The results show that the GNSs/Al composites with the high relative density and dispersed distribution of GNSs were fabricated. A good interfacial bonding was obtained in GNSs/Al composites. The aluminum carbide Al_4C_3 phases with granular and short rod-like morphology were found at interface. With the increase of GNSs content, the content of Al_4C_3 phases increases. The dislocations were also found near the interface, and the density of dislocation reduced with the increase of Al_4C_3 content. The Vickers hardness of GNSs/Al composites increases obviously with the

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