

عنوان مقاله:

Thermal and electrical properties of graphene reinforced copper nanocomposite

محل انتشار:

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خلاصه مقاله:

This study reports on the thermal and electrical properties of graphene reinforced copper (Cu/Gr) nanocomposite. The nanocomposite was fabricated by a powder metallurgy technique. A wet ball milling followed by spark plasma sintering (SPS) was used to obtain a good distribution of 1 wt.% graphene in the copper matrix. The samples were characterized using X-ray diffraction (XRD) and field emission scanning electron microscopy (FESEM). Relative density, electrical and thermal conductivities and coefficient of thermal expansion (CTE) were also evaluated. The thermal conductivity value of Cu/Gr nanocomposite was 351 W/mK, while the pure Cu has lower conductivity (297 W/mK). Measured thermal and electrical conductivity of pure Cu compared with Cu/Gr shows the graphene as a good reinforcement for Cu if it was completely dispersed in the matrix. A lower CTE was obtained by adding of graphene to Cu.

کلمات کلیدی:

Powder metallurgy; Copper; Graphene; Nanocomposite; Electrical and Thermal properties

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