

Developments on the manufacture of copper matrix composites reinforced with high volume fraction of Vapour Grown Carbon Nanofibers (VGCFs) for heat management applications

R.Martínez, J. Barcena, J.Maudes, P.Egizabal, J.Coletto, M.García de Cortázar
INASMET-Tecnalia, Mikeletegi Pasealekua, 2 E-20009 San Sebastián, Spain

Thermal management is one the main issues concerning power electronics. At present overheating causes 50% of failures of electronic devices. New developments will only be possible with heat sinks made of materials possessing very high thermal conductivity and a low CTE.

The investigation is focused on copper matrix composites reinforced with carbon nanofibres for use in advanced electronic applications. The fibers are coated by autocatalytic deposition of copper and later consolidated by hot-pressing. One of the main technical challenges of the investigation is the interfacial behaviour of copper and carbon, which shows absence of wettability and no solubility. Different elements and manufacturing routes investigated to overcome these difficulties will be present and discussed.