Instituto Universitario de Investigación en Nanociencia de Aragón
Universidad Zaragoza

LMA LABORATORIO DE MICROSCOPIAS AVANZADAS

SEMINARIO

Magnetotransport properties of a graphite microwire produced by He+ bombardment and embedded in a diamond crystalTítulo

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We have investigated the magnetotransport properties of a graphite microwire (GM) embedded in a diamond crystal in the temperature range of 2 K to 300 K and magnetic field to ± 8 T. The GM was produced at ≈ 3 μm below the surface of a diamond crystal through the implantation of He+ ions of 1.8 MeV energy using a microbeam. The initial wire was amorphous and was crystallized after heat treatment at T≈ 1475 K. After a first annealing treatment the electrical transport at low temperatures is well described by a fluctuation-induced tunneling conductance model. The tunneling process occurs between the partially graphitized grains separated by nearly insulating thin amorphous regions. After a second annealing the transport mechanism changes to variable range hopping conduction. A finite magnetoresistance (MR) was observed at temperatures T<250 K, which can be well described by a semi-empirical model that takes into account a spin dependent scattering process. The appearance of the graphitic structure after annealing treatment was confirmed by confocal Raman spectroscopy.

22 DE ABRIL. 12.00h.

AULA DEL EDIFICIO I+D