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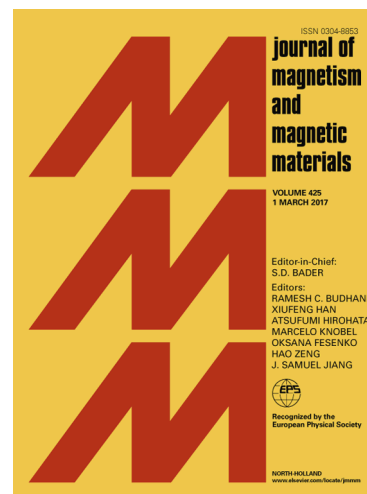
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Magnetic properties of iron nanowire encapsulated in carbon nanotubes doped
with copper

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ABSTRACT

An iron nanowire encapsulated in carbon nanotubes doped with copper (Fe@CuCNTs) can be described as anisotropic Ising model. General formulas of the magnetization and the magnetic susceptibility for the system are calculated based on the effective field theory with correlations (EFT). The effects of the exchange coupling, the anisotropy and the external magnetic field on the magnetic properties of the system have been discussed. The structure index N of armchair carbon nanotube plays an important role in magnetization, susceptibility, blocking temperature and hysteresis loop for the system. This system maybe has potential applications in information recording and spintronics.

Keywords: Carbon nanotubes; magnetization; susceptibility, blocking temperature

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