

Magnetic phase transition and large room temperature magnetoresistance in Ni doped FeRh filmsJia-hui Chen, Jing Ma^{*}, Yu-jun Zhang, Liang Wu, C. W. Nan

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Email: ma-jing@tsinghua.edu.cn**Abstract**

We have investigated the structural, magnetic and electrical transport properties of the Ni doped FeRh films prepared by magnetron co-sputtering. A large magnetoresistance of 35%, induced by a reversible antiferromagnetic to ferromagnetic phase transition, is obtained at room temperature with only 1 mol.% Ni addition. Magnetic field is revealed to have an equivalent effect as temperature to drive the magnetic phase transition. Moreover, the way to realize a nonvolatile room temperature magnetoresistance effect is also discussed. These results give FeRh the possibility of technological application in the spintronic field at room temperature, which are referential to other material systems with a first-order magnetic phase transition.

Key Words: FeRh, magnetic transition, doping, magnetoresistance, room temperature

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