

Magnetocaloric effect of evaporated Fe on Gd foils

Abstract:

The main objective of the present study was to investigate the effect of Fe-coated on magnetocaloric effect (MCE) of Gd foil. The Fe film with thickness 142 nm and 193 nm was grown on both side of 500 μ m Gd foil using evaporation. Magnetic properties of the samples were investigated using vibrating sample magnetometer. The magnetic entropy change was calculated from the isothermal magnetization measurements under in-plane and out-of-plane applied magnetic field of 10 kOe. The maximum entropy changes obtained from in-plane isothermal magnetization measurement for 142 and 193 nm Fe-coated samples were comparable to that of the Gd foil (3.1 J/kgK). The entropy change calculated from out-of-plane isothermal magnetization measurement for Fe-coated Gd sample higher than that of the pure Gd sample. The enhancement of MCE behaviors was explained by magnetic field amplification due to the coating layers.

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