# Magnetocaloric Effect of $RM_2$ (R=rare earth, M=Ni, Al) Intermetallic Compounds Made by Centrifugal Atomization Process for Magnetic Refrigerator

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Magnetic refrigeration makes use of magnetocaloric effect and has the potential to achieve high thermal efficiency, since reversible thermal cycle is possible in principle. We have been developing a magnetic refrigerator for hydrogen liquefaction. We have been investigated various magnetic materials that are suitable from 20 K to room temperature.
$RM_2$ (R= rare earth, M= Al, Ni and Co) compounds have large entropy change and magnetic transition temperatures can be controlled by changing of R and/or M. In order to improve heat transfer between magnetic material and heat transfer fluid, spherical powdered $RM_2$ compounds were synthesized by centrifugal atomization process. By measuring the magnetization and heat capacity, we obtained entropy change by magnetic fields and temperature entropy diagrams, which are essential for analyzing the magnetic refrigeration cycle. All samples showed sharp magnetic transitions and had good potentials for use in magnetic refrigeration.