

**Extension of Operational Temperature Range on Magnetic Heat Pump  
Aimed at Application to Onboard Air-conditioner**

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Air-conditioners including those for railway vehicles, are required to reduce the use of alternative freon in order to prevent global warming. It can be possible that the heat pump cycle is constituted by, for example, a process of applying/removing a magnetic field to/from a magnetic material, rather than performing the process of compressing or expanding gas (including alternative freon). As a basic study, a magnetic heat pump was tested using Mn-based magnetic materials of different Curie temperatures, where the operational temperature range was extended to that using the magnetic material of a single Curie temperature. The result predicts that magnetic heat pump can be applicable to air-conditioners.