水素液化技術を可能にする磁性材料

Magnetic Materials Enabling Hydrogen Liquefaction Technology

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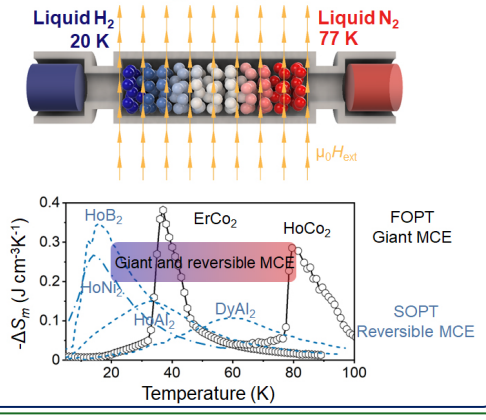
C-2

キーワード：#Magnetic materials, #magnetocaloric, #hydrogen liquefaction

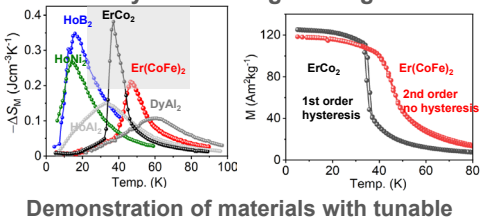
Magnetic cooling for H_2 liquefaction

Material need for practical application



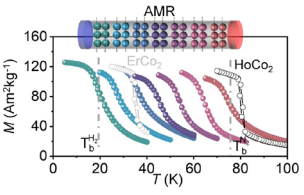
$ErCo_2$-based refrigeration materials

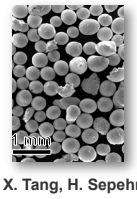
Hysteresis engineering

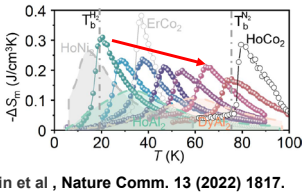


Demonstration of materials with tunable transition temperature for practical application

Gas atomization







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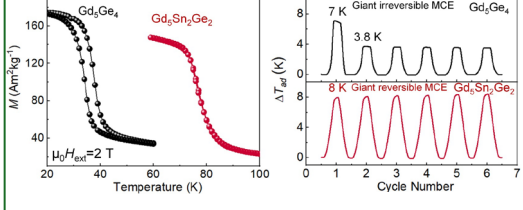
Search for new materials for temperature range of 40-80 K

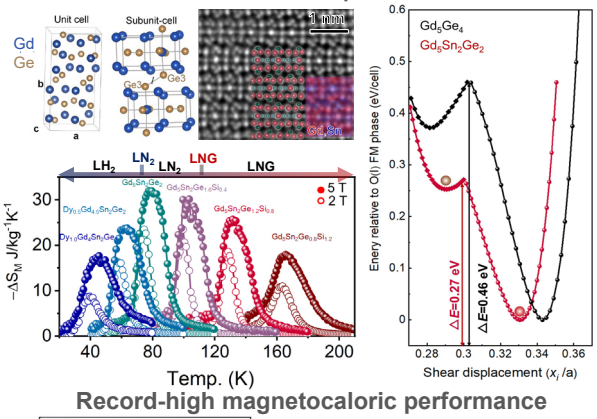
Gd_5Ge_4-based refrigeration materials



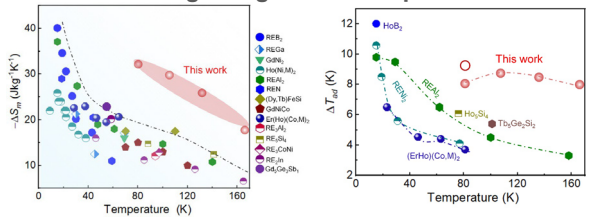
Tunable hysteresis, T_{tr} & reversibility of MCE

Novel approach for hysteresis design

Atomic feature controls phase transition



Record-high magnetocaloric performance



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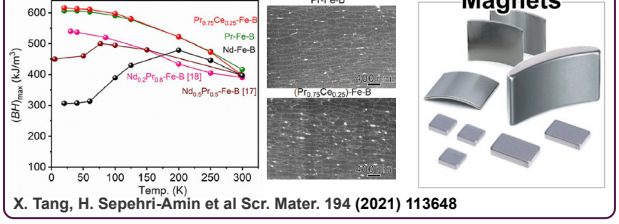
特願. 2023-062517, 2023-065521,2023-062518, 2023-062519, 2023-065522

Can we change source of magnetic field?

portable cryogenic permanent magnets



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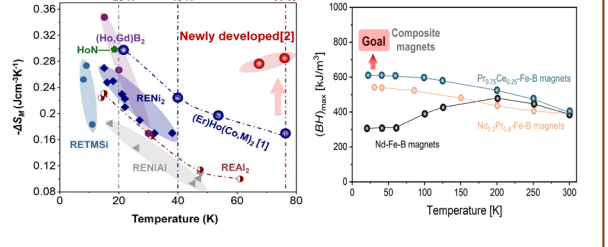
Conclusion and outlook



1- Our magnetic refrigeration materials show record high performance and strong potential for practical system integration.

2- We have developed cryogenic permanent magnets with record performance, enabling new applications such as cryogenic drones and synchrotron/insertion devices.

研究者① プロフィール　研究者② プロフィール　ポスターPDF

こんな応用分野（製品）に活かせる！

- Magnetic cooling for H_2 liquefaction.
- Magnetic cooling for prevention of H_2 boil-off
- Cryogenic permanent magnets for various applications

こんな企業と連携したい！

- Companies interested in magnetic refrigeration.
- Companies interested in H_2 liquefaction & transportation
- Companies interested in cryogenic permanent magnets.