

演題: **”Layered materials for thermoelectricity”**

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場所: 工学部材料化学棟 MC204

Metal-transition oxides are providing a large class of materials for which the strong interplay between spins/charges/lattice are responsible for a wide range of interesting properties. Among them, there has been a tremendous effort devoted to the search for thermoelectric materials to convert waste-heat into electricity. In that respect, the layered cobaltites where the electronic conduction is ensured by CdI_2 -type layers has been the focus of much attention [1]. In these A_yCoO_2 structures, the electronic conduction is ensured by the M-O network.

Interestingly, the covalency of the compounds of the A_yMX_2 general formula can be increased by going from oxygen to selenium through sulfur. This will be illustrated by the comparison of misfit cobaltites with doped TiS_2 sulfides [2] and with the AgCrSe_2 selenide [3]. The latter with $zT=1$ @ 800K can be regarded as a realization of the “phonon glass electron crystal” concept: the order/disorder structural transition of the Ag^+ ions in the separating layers leads to low thermal conductivity values. During this seminar, I will focus on the importance of these layered materials to discover thermoelectrics and other promising properties such as multiferroicity.

References

- [1] Thermoelectric oxides by S. Hébert. And A. Maignan, (2010) in Functional Oxides (eds D. W. Bruce, D. O’Hare and R. I. Walton), John Wiley & Sons, Ltd, Chichester, UK. doi: 10.1002/9780470686072.ch4.
- [2] E. Guilmeau, Y. Bréard and A. Maignan, Appl. Phys. Lett. 99, 052107 (2011).
- [3] F. Gascoin, and A. Maignan, Chem. Mater. 23, 2510 (2011)

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