

第 186回フロンティア材料研究所講演会

講師: Professor Michael Hayward

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10月11日(金曜)10時30分~12時 大学会館2F 集会室1にて

演題: Low-temperature Topochemical Reactions as a Route to Novel Electronic Materials

In a topochemical reaction atoms or ions are inserted into, or extracted from, an existing solid phase, whilst retaining the overall crystal structure of the original material. As these chemical manipulations are performed under kinetic control, extremely metastable phases can be produced. By applying this synthetic strategy to complex transition metal oxides, for example via the low-temperature 'de-intercalation' of oxide ions with binary metal hydrides (NaH, CaH₂, LiH), phases containing transition-metal cations with highly unusual combinations of oxidation state and coordination geometry can be prepared (e.g. square-planar Ni¹⁺, Fe²⁺, Ru²⁺, Ir²⁺). Furthermore, these same binary hydrides can also bring about hydride-for-oxide anion exchange reactions, giving access to highly metastable transition-metal oxyhydride phases. Recent results studying the topochemical reduction of Ru, Rh and Ir containing phases will be discussed, both in terms of the reactions which occur and the electronic behaviour of the highly reduced oxide and oxyhydride phases produced.

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