

The 125th GREEN Seminar



Structural Transformation of Layered Chalcogenides Induced by Redox-Active Anionic Dimers

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Intercalation and deintercalation play a principal role in the working mechanism of today's Li-ion secondary batteries (LIB). In most of practical LIBs, transition metal cations have been exploited as redox center of host materials, while it is also possible to make use of redox activity of e.g. chalcogen anions. This 'anionic' redox during (de)intercalation is examined already in 1970s as well as its potentiality as cathode materials. Over the recent decade, uses of anionic redox has been extensively studied as a promising approach of next-generation cathode materials.

For the last few years, we have been interested in this anionic redox, but particularly from the viewpoint of structural chemistry. Since redox of main-group elements such as chalcogen should involve its covalent bond formation and cleavage, anionic redox is likely to trigger unique structure transformations, distinct from conventional intercalation chemistry based on 'cationic' redox. This contribution will highlight how the crystal structures can be altered by such manipulations of redox-active anion-anion bonds.

Reference : Sasaki et al. *ACS Org. Inorg.* **2024**, 4, 26-40.

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Namiki-site

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