

Built-in Nanostructure and Electro Active Functions in Oxides

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Oxides are the most abundant and stable forms in our territorial crust. A unique feature of oxides is to have a wide variety of crystal structures compared with other material system. We are focusing on low dimensional crystals having nano-porous and layered structures with expectation that novel electro active functions derived from low dimensional electronic structures are realized.

In this talk, the following results are to be presented out of our research achievements;

- (1) Conversion of a cement constitution $12\text{CaO} \cdot 7\text{Al}_2\text{O}_3$ with nanoporous crystals to transparent conductor, metal and eventually superconductors.
- (2) Transparent P-type semiconductors and novel superconductors in layered metal oxychalcogenites and oxypnictides.
- (3) Transparent amorphous oxide semiconductors and their application to flexible, high performance thin film transistor.