Structural Science of New Ionic Conductors

K. Fujii, M. Yashima

Department of Chemistry, School of Science, Tokyo Institute of Technology, 2-12-1-W4-17, O-okayama, Meguro-ku, Tokyo 152-8551, Japan

kfujii@cms.titech.ac.jp

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Ionic conductors have attracted considerable attention because of their potential applications such as fuel cells, batteries, and gas sensors. Ionic conductivity is strongly dependent on the crystal structure, and it is important to explore new structure family of ionic conductors, and investigate the mechanism of ionic conductors through structure analysis. Our group reported a number of new oxide-ion conductors and proton conductors, which were discovered by several different strategies (Fig. 1). The crystal structures of these ionic conductors were investigated by (synchrotron) X-ray and neutron diffraction techniques, and we investigate ion conduction paths and origins of high (or sometimes low) conductivity. In this presentation, the details of our researches on new ionic conductors will be shown.

Figure 1. Ionic conductors reported by our group.