

Abstract Submitted  
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**FT-IR evaluation of  $\text{SmFeAsO}_{1-x}\text{F}_x$  ( $x = 0, 0.069$ )**  
HAJIME SHINOHARA, YOICHI KAMIHARA, Department of Applied Physics and Physico-Informatics, Keio University — Optical properties of superconducting  $\text{SmFeAsO}_{1-x}\text{F}_x$  ( $x=0, 0.069$ ) were demonstrated by reflection measurement with FT-IR method. Polycrystalline  $\text{SmFeAsO}_{1-x}\text{F}_x$  samples were synthesized using two-step solid state reaction described elsewhere [New J. Phys. **12**, 033005 (2010)]. Purity of samples was checked by X-ray diffraction patterns using Cu K- $\alpha$  radiation. The reflection measurement was performed at the range from  $9000\text{ cm}^{-1}$  to  $18000\text{ cm}^{-1}$  that was corresponded to an energy region from 1.12 eV to 2.25 eV. A photoconductivity of  $\text{SmFeAsO}_{1-x}\text{F}_x$  was determined by Kramer-Kronig (KK) relation. Reflectivity and photoconductivity measurements, as well as by FT-IR, at various areas were performed to define an energy level of materials [EPL, **84** 67013 (2008), and J. Phys. Soc. Jpn. **80** 013707 (2011)]. Obtained photoconductivity and reflection spectra were similar to those of  $\text{LaFeAsO}_{1-x}\text{F}_x$  that was a basic compound of  $\text{LnFeAsO}_{1-x}\text{F}_x$  ( $\text{Ln}=\text{La, Ce, Sm}$ ), reported by Z. G. Chen et al [Phys. Rev. B **81**, 100502 (2010)]. Our result suggests that the energy band structure of  $\text{SmFeAsO}$  was affected by F-doping even in visible area. Details and temperature dependence of the reflection and photoconductivity spectra will be presented at the conference.

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