

Abstract Submitted
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Angular dependence of x-ray absorption spectrum for field-aligned Fe-based superconductors¹ Y.B. YOU, B.C. CHANG, M.F. TAI, H.C. KU, National Tsing Hua University, Hsinchu, Taiwan, Y.Y. HSU, National Taiwan Normal University, Taipei, Taiwan, L.Y. JANG, J.F. LEE, National Synchrotron Radiation Research Center, Hsinchu, Taiwan — Anisotropic Fe *K*-edge and As *K*-edge x-ray absorption near-edge spectrum measurements on superconducting ($T_c=52$ K) $(\text{Sm}_{0.95}\text{La}_{0.05})\text{FeAs}(\text{O}_{0.85}\text{F}_{0.15})$ field-aligned microcrystalline powder are presented. The angular dependence of Fe pre-edge peak (dipole transition of Fe $1s$ electrons to Fe $3d$ /As $4p$ hybrid bands) relative to the tetragonal ab plane of aligned powder indicates larger density of state along the c axis and is consistent with the local-density approximation band-structure calculation. The anisotropic Fe *K*-edge spectra exhibit a chemical shift to lower energy compared to FeO which are closely related to the itinerant character of $\text{Fe}^{2+} 3d^6$ orbitals. The anisotropic As *K*-edge spectra are more or less the mirror images of Fe *K*-edge due to the symmetrical Fe-As hybridization in the FeAs layer. Angular dependence of As main peak (dipole transition of As $1s$ electrons to higher-energy hybrid bands) was observed suggesting character of As $4d e_g$ orbitals.

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