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Raman spectroscopic analysis for grain boundary of Superconducting polycrystalline $SmFeAsO_{1-x}F_x$ HAJIME SHINOHARA, Department of Applied Physics and Physico-Informatics, Keio University, MASAYA FUJIOKA, Nano Frontier Materials Group, National Institute for Materials Science (NIMS), HIROKI TANIGUCHI, MITSURU ITOH, TOSHIYUKI ATOU, Materials and Structures Laboratory, Tokyo Institute of Technology, YOSHIHIKO TAKANO, Nano Frontier Materials Group, National Institute for Materials Science (NIMS), HIROAKI KUMAKURA, National Institute for Materials Science (NIMS), MASANORI MATOBA, YOICHI KAMIHARA, Department of Applied Physics and Physico-Informatics, Keio University — The observation of grain boundary structures is essential technique to fabricate high-T_c superconducting wires. Spatial crystal distribution analysis for grain boundary of superconducting polycrystalline $SmFeAsO_{1-x}F_x$ is demonstrated by Raman Spectroscopy. Polycrystalline $SmFeAsO_{1-x}F_x$ samples were synthesized using two-step solid state reaction described elsewhere [New J. Phys.**12**, 033005 (2010)]. Samples' surface and their structures were checked by microscopic optical measurement and electron beam backscattering diffraction (EBSD) analysis. The Raman spectroscopy was performed at the range from 150 cm^{-1} to 500 cm^{-1}. F contents (x) were 0, 0.019, 0.037, 0.045, 0.069, 0.075. Although our several spectra are similar to which had been reported [Hadjiev, et al, Phys. Rev. B. **77**, 220505 (2008)], our results indicate that grain boundary structures are mixtures of small single crystalline $SmFeAsO_{1-x}F_x$ and amorphous-FeAs. Details of the Raman spectra will be presented at the conference.

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