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Superconducting Properties of KFe2Se2 YOSHIHIKO TAKANO, National Institute for Materials Science (NIMS) — Layer structured iron selenide, FeSe has the simplest crystal structures among iron-based superconductors. It shows superconductivity with transition temperature (Tc) of 13 K under ambient pressure. The Tc increases up to 37 K by applying high pressure [1-3]. These facts indicate that the FeSe-layers are favorable structures to show superconductivity. When potassium is doped to the interlayer of FeSe, the resulting compound KFe2Se2 shows superconductivity at around 31 K under ambient pressure. However, the superconducting properties have no consensus even in the ambient pressure condition, because of its reproducibility, inhomogeneity, and instability, and so on. It is necessary to obtain the high-quality single crystals to clarify the intrinsic properties. In this study, we cultivate the preparation method for the single crystalline KFe2Se2 [4], and investigate its superconducting properties by electrical properties using ARPES, magnetic susceptibility and transport properties, and single crystal structural analysis. [1] Y. Mizuguchi et al., Appl. Phys. Lett. 93, 152505 (2008). [2] S. Margadonna et al., Phys. Rev. B 80, 064506 (2009). [3] S. Masaki et al., J. Phys. Soc. Jpn. 78, 063704 (2009). [4] T. Ozaki et al., Euro. Phys. Lett., 98, 27002 (2012).

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