Abstract Submitted
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Novel synthesis method of $K_xFe_{2-y}Se_2$ single crystal TOSHINORI OZAKI, HIROYUKI TAKEYA, SATOSHI DEMURA, KEITA DEGUCHI, YASUNA KAWASAKI, HIROYUKI OKAZAKI, HIROSHI HARA, TAKAHIDE YAMAGUCHI, HIROAKI KUMAKURA, YOSHIHIKO TAKANO, National Institute for Materials Science — The discovery of superconductivity in $K_xFe_{2-y}Se_2$ with $\sim T_c$ 31 K has triggered a great interest in the field of iron-based superconductors [1]. $K_xFe_{2-y}Se_2$ superconductor has several practical advantages of relatively high T_c, high upper critical field (H_{c2}) and less toxicity compared to FeAs-based superconductors. However, the procedure for producing $K_xFe_{2-y}Se_2$ single crystal is complicated and time-consuming: At first, the FeSe precursor was prepared, and then the single crystals of $K_xFe_{2-y}Se_2$ were grown by the self-flux method. The simplification of the synthesis is really important for applications. We present a novel synthesis method of $K_xFe_{2-y}Se_2$ single crystal, which is very simple and quick. A superconducting transition of this sample appeared at T $\sim$31.6 K. After quenching the sample, the calcurated volume fraction from dc magnetic susceptibility was dramatically increased, consistent with the previous report [2]. We will also report the details of the synthesis, transport properties and microstructures of the samples. 1)J.Guo, *et al*, Phys. Rev. B **82**, 180520 (2010). 2)H. Lei, *at el*, arXiv: 1109.0534.

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