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**Physical properties of superconducting single crystal iron sulfide**

EFRAIN E. RODRIGUEZ, CHRISTOPHER K. H. BORG, XIUQUAN ZHOU, JOHNPIERRE PAGLIONE, University of Maryland, UNIVERSITY OF MARYLAND COLLABORATION — Recently, the simple binary tetragonal iron sulfide, FeS, was found to be a superconductor with a  $T_c = 5\text{K}$ . [1] We have prepared single crystals of tetragonal iron sulfide through hydrothermal de-intercalation of  $\text{K}_x\text{Fe}_{2-y}\text{S}_2$ . The  $\text{K}_x\text{Fe}_{2-y}\text{S}_2$  single crystal precursors were grown by slow cooling of stoichiometric melts of K, Fe and S. The silver, plate-like FeS single crystals were highly crystalline with a superconducting transition temperature ( $T_c$ ) of 4 K. The high quality of the FeS crystals revealed highly anisotropic nature of the magnetic and electronic properties intrinsic to FeS. The physical properties and thermal stability of single crystal FeS will be discussed in detail. [1]Lai X, et al., *JACS* **2015** 137 (32)

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