

Abstract Submitted
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Structure and magnetic properties of $K_{1-\delta}(Cu_{1-x}Fe_{1+x})Se_2$ ELIZABETH CHAVIRA, UNAM, PIERRE TOULEMONDE, PIERRE STROBEL, ANDRES SULPICE, SEBASTIANE PAIRIS, CHRISTOPHE LEPOITTEVIN, Institut Neel , PLUM COLLABORATION — In our attempt to synthesize new layered $K_{2-x}Ba_xCuO_2Fe_2Se_2$ hybrid materials [1] we have a new 122 selenide. Started from KO_2 , FeSe and a precursor of Ba_2CuO_3 , put as pellets into alumina crucible and reacted at temperature 400-810 C in sealed quartz tube under vacuum. The XRD show the presence of a tetragonal I4/m phase, similar to the $KFe_{2-z}Se_2$ (K122) reported [2] mixed with Fe_3O_4 magnetite impurity. The a-axis is increased and c-axis decreased compared to K122, an indication of partial substitution of the cationic site. Our SEM and TEM study coupled to EDX confirm the I4/m lattice and gives an average $(K_{0.63}Ba_{0.28})(Fe_{0.46}Cu_{0.30})_2Se_2$ composition. This compound is stable in air, on the contrary of the pure K-based 122 phase: it means that the Cu substitution and/or Ba substitution for K and Fe sites respectively stabilize the structure. In addition the electron diffraction patterns do not show signatures of Cu/Fe orderings, in similarity with $K(MnAg)Se_2$ compound [3]. The magnetization measurements show two transitions in addition to the one around 125K due to magnetite, a first one around 250K and another one at 50K. Superconductivity does not seem to be present in this selenide

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