Abstract Submitted
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Bromine-doping dependence of crystal structure and superconductivity in $\mathbf{FeSe_{1-x}Br_x}$[1] Y.T. SHEN, S.C. CHEN, K.J. SYU, W.H. LEE, Department of Physics, National Chung Cheng University, W. H. LEE TEAM — Our experimental data indicate that the crystal structure formation in $FeSe_{1-x}Br_x$ is dependent on the amount of Br. For the samples with x between 0.18 and 0.3, the single tetragonal β-FeSe phase with space group P4/nmm could be obtained by carrying out the low-temperature (400 °C) annealing after reaction at 680 °C. As to the sample with $x = 0.1$, a heat firing at 680 °C is in favor of forming single hexagonal δ-FeSe phase with space group $P6_3/mmc$. Powder x-ray diffraction and crystallographic data provide the suggestion that the β tetragonal PbO-type phase is related to the superconducting state while the δ hexagonal NiAs-type phase has no effect on the superconductivity. Magnetization data confirm the bulk character of the superconducting state with a T_c around 5 K. Larger superconducting volume fraction appears in the single-phase sample with x near 0.2.

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