Effects of Co Doping on the Transport Behaviors and Superconducting Transition Temperature of $FeSe_{0.4}Te_{0.6}$ single crystals

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To clarify the superconducting pairing mechanism of iron-based superconductors, it is important to identify the symmetry of the superconducting order parameter. The so-called $s_{\pm}$-symmetry has been proposed as the most probable scenario, because the superconductivity appears near the antiferromagnetic phase. The suppression rate of T_c in $LaFe_{1-y}Co_yAsO_{0.89}F_{0.11}$ polycrystals, on the other hand, is too small to be explained by the pair breaking effect expected for $s_{\pm}$-symmetry. [M. Sato *et al.*, J. Phys. Soc. Jpn. **79** (2010) 014710.] In discussing impurity effect, we have to pay attention to the residual resistivity, ρ_{res}, that is an indicator of the strength of impurity potential, since the T_c suppression rate depends on the impurity potential strongly. However, it is difficult to discuss ρ_{res} in polycrystalline samples because of the existence of grain boundaries. In this study, we measure transport and magnetic properties of Co-doped $FeSe_{1-x}Te_x$ single crystals to discuss both the suppression rate of T_c and ρ_{res}. The T_c of $Fe_{1-y}Co_ySe_{0.4}Te_{0.6}$ single crystals grown by the Bridgman method decreases about 1 K with increasing 1% of Co content. In the presentation, we evaluate the impurity potential of Co based on ρ_{res} and discuss the possible pairing symmetry in $Fe_{1-y}Co_ySe_{0.4}Te_{0.6}$ single crystals.