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Title:

Thermal Treatment and the Collapse Transition in Sn-flux grown CaFe_2As_2

Abstract:

The superconducting parent compound CaFe_2As_2 displays an AFM transition at 168 K that is closely linked to an orthorhombic structural distortion. Studies on self-flux (FeAs) grown crystals have revealed the ability to tune the structural and magnetic properties of this system by annealing, resulting in a phase diagram that spans from tetragonal/orthorhombic antiferromagnetism to the non-magnetic collapsed tetragonal phase. In this study, we investigate the effects of annealing on CaFe_2As_2 crystals grown in Sn flux in order to understand the role of growth conditions on the resultant phase diagram. We present investigations of x-ray, EDS, electrical transport and magnetization measurements and compare the resultant phase diagram with that of the self-flux case.