Effects of annealing time and temperature on the transition temperature and low temperature state of AFe2As2 materials

SHENG RAN, SERGEY BUD’KO, ALEX THALER, Ames Laboratory U.S. DOE and Department of Physics and Astronomy, Iowa State University, DOMINIC RYAN, Physics Department/McGill University, YUJI FURUKAWA, BEAS ROY, ANDREAS KREYSSIG, ROBERT MCQUEENEY, DANIEL PRATT, ALAN GOLDMAN, PAUL CANFIELD, Ames Laboratory U.S. DOE and Department of Physics and Astronomy, Iowa State University — Over the past couple of years the AFe2As2 (A = Ca, Sr, Ba) family of compounds has become a model system for the study of FeAs-based superconductivity. Superconductivity can be stabilized by hole and electron doping (on A and Fe sites) as well as hydrostatic pressure and isoelectronic substitutions on both the Fe and As sites. In all cases the adequate suppression of the structural / antiferromagnetic phase transition appears to be a necessary condition for the appearance of superconductivity. In this talk we will review the effects of annealing time and temperature on the structural / antiferromagnetic phases of AFe2As2. Transition temperature / time and transition temperature / annealing temperature plots will be presented and discussed.

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