

Abstract Submitted  
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**High Resolution X-ray Scattering Studies of Structural Phase Transitions in  $\text{BaFe}_{2-x}\text{Cr}_x\text{As}_2$**  B.D. GAULIN, J.P. CLANCY, J.J. WAGMAN, McMaster University, A.S. SEFAT, Oak Ridge National Laboratory — While the effects of electron-doping on the parent compounds of the 122 family of Fe-based superconductors have been extremely well-studied in recent years, far less is known about the influence of hole-doping in compounds such as  $\text{BaFe}_{2-x}\text{Cr}_x\text{As}_2$ . In contrast to the electron-doped 122 systems, the hole-doped compounds do not become superconducting. Furthermore, while the hole-doped compounds exhibit similar structural and magnetic phase transitions, they appear to be much less sensitive to dopant concentration. We have performed high resolution x-ray scattering and magnetic susceptibility measurements on single crystal samples of  $\text{BaFe}_{2-x}\text{Cr}_x\text{As}_2$  for Cr concentrations ranging from  $0 \leq x \leq 0.67$ . These measurements allow us to determine the magnetic and structural phase transitions for this series and map out the low temperature phase diagram as a function of doping. In particular, we have carried out detailed measurements of the tetragonal (I4/mmm) to orthorhombic (Fmmm) structural phase transition which reveal how the orthorhombicity of the system evolves with increasing Cr concentration and how this correlates with the values of  $T_s$  and  $T_m$ .

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