

Abstract Submitted
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Structural and physical properties of $\text{Ba}(\text{Fe}_{1-x}\text{Ru}_x)_2\text{As}_2$ single Crystals¹ ALEXANDER THALER, NI NI, Dept of Physics/Ames Laboratory, Iowa State University, ALFRED KRACHER, JIAQIANG YAN, Ames Laboratory, Iowa State University, SERGEY BUD'KO, PAUL CANFIELD, Dept of Physics/Ames Laboratory, Iowa State University — Single crystals of $\text{Ba}(\text{Fe}_{1-x}\text{Ru}_x)_2\text{As}_2$, $x < 0.4$, have been grown and characterized by compositional, structural, magnetic and transport measurements. These measurements show that the structural/magnetic phase transition found in pure BaFe_2As_2 at 134K is suppressed monotonically by Ru doping. Superconductivity is stabilized at low temperatures for $x > 0.2$ and continues through the highest doping levels we have been able to produce. The superconducting region is dome like, with maximum $T_c \sim 18\text{K}$ found for $x \sim 0.25$. The phase diagram of temperature versus doping based on our measurements will be compared to those of the $\text{Ba}(\text{Fe}_{1-x}\text{TM}_x)_2\text{As}_2$ (TM=Co, Ni, Rh, Pd) series as will the associated changes in unit cell dimension and volume. Since Ru doping does not provide extra electrons, the T-x phase diagram will also be compared with T-P phase diagram of pure BaFe_2As_2 .

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