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Magnetic order and lattice distortion in Rh- and Cu-doped $BaFe_2As_2$ single crystals A. KREYSSIG, M.G. KIM, S. NANDI, Ames Laboratory, Dept of Physics and Astronomy, Iowa State University, W. TIAN, J. ZARESTKY, Ames Laboratory, A. THALER, N. NI, S.L. BUD'KO, P.C. CANFIELD, R.J. MCQUEENEY, A.I. GOLDMAN, Ames Laboratory, Dept of Physics and Astronomy, Iowa State University — Recent investigations of superconducting Co-doped $BaFe_2As_2$ have highlighted the interplay between superconductivity, magnetism and structure. Here we report on the antiferromagnetic order, lattice distortion and their response to superconductivity in Rh-doped $BaFe_2As_2$ and compare the behavior with non-superconducting Cu-doped $BaFe_2As_2$ single crystals. Results of the neutron scattering experiment performed at HB1A, HFIR, Oak Ridge, are correlated with high-resolution x-ray diffraction, resistance and magnetization measurements. The magnetic and structural phase transitions are similarly suppressed by the different dopings and the temperature dependencies of the order parameters are comparable, whereas only the Rh-doped sample shows a reduction of the antiferromagnetically ordered Fe moment in the superconducting state as reported for the Co-doped series. – The work at the Ames Laboratory was supported by the US DOE, office of science, under contract No. DE-AC02-07CH11358.

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