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Doping dependence of the specific heat of single crystal $BaFe_2(As_{1-x}P_x)_2$[1] CARLOS CHAPARRO, LEI FANG, HELMUT CLAUS, GEORGE CRABTREE, VALENTIN STANEV, WAI-KWONG KWOK, ULRICH WELP, Materials Science Division, Argonne National Laboratory, Argonne, Illinois 60439, USA, MORTEN ESKILDSEN, Department of Physics, University of Notre Dame, Notre Dame, IN 46556, USA, ANDREAS RYDH, Department of Physics, Stockholm University, SE-10691 Stockholm, Sweden — We present a systematic study of the specific heat transitions on a series of $BaFe_2(As_{1-x}P_x)_2$ single crystals with phosphorous doping ranging from near optimum doped x = 0.3 to strongly over doped x = 0.55. Our results reveal that $BaFe_2(As_{1-x}P_x)_2$ follows the scaling $\Delta C/T_c \sim \quad T_c^2$ remarkably well.[2] The clean-limit nature of this material imposes new restraints on theories aimed at explaining the scaling. We find that the Ginzburg-Landau parameter decreases significantly with doping whereas the superconducting anisotropy is $\Gamma \sim 2.6$, independent of doping.

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[2]S. L. Bud'ko, N. Ni, P. C. Canfield, Phys. Rev. B **79**, 220516 (2009).

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