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**Effect of irradiation-induced defects on the phase diagram of $Ba_{1-x}K_xFe_2As_2$**[1] U. WELP, J. HUA, A.E. KOSHELEV, H. CLAUS, W.K. KWOK, A. KAYANI, Materials Science Division, Argonne National Laboratory, H.Q. LUO, Z.S. WANG, G. MU, H.-H. WEN, Institute of Physics, Chinese Academy of Sciences — We present a study of the changes of $T_c$ and of the upper critical field of $Ba_{1-x}K_xFe_2As_2$ that are induced by irradiation with 9 MeV protons and 1.4 GeV Pb-ions. Irradiation to a fluence of 2x$10^{15}$ protons/cm$^2$ creates sparse individual point defects and their clusters. These are sufficient to increase vortex pinning, but do not alter the phase diagram in a noticeable way. In contrast, heavy-ion irradiation to a dose matching field of 2 T induces a suppression of $T_c$ by $\sim$1K and a reduction of the jump of the specific heat, $\Delta$C, at $T_c$ by $\sim$50 %. Furthermore, the upper critical field slopes increase to enormously high values of $dH^c_{c2}/dT$=-12.8 T/K and $dH^{ab}_{c2}/dT$=-21 T/K, corresponding to a low anisotropy of $\Gamma \sim 1.6$. Such behavior is not expected for a d-wave superconductor, but is consistent with pair-breaking by non-magnetic scattering centers in a superconductor with $s_\pm$ gap symmetry.

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