Suppression of the critical temperature in NdFeAs(OF) single crystal by Kondo-like scattering induced by irradiation

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The paper report the first comprehensive investigation of the suppression of the critical temperature $T_c$ of NdFeAs(OF) single crystal by disorder induced by $\alpha$-particle irradiation. Our data indicate that irradiation defects produce both nonmagnetic and magnetic scattering, resulting in the Kondo-like excess resistance $\Delta \rho(T) \propto \ln T$ over 2 decades in temperatures above $T_c$.

Despite high densities of irradiation defects, the dose at which $T_c$ is suppressed to zero is comparable to that for MgB$_2$ but is well above the corresponding values for cuprates. Such remarkably weak $T_c$ suppression by strong magnetic and nonmagnetic disorder may reveal novel features of superconductivity and magnetism in pnictides.