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Thermal and Transport properties of $\mathbf{U_2Pt_{1-x}Ir_xC_2}$ MIN GU KANG, CALDES, Institute of Basic Science, Pohang, Korea, Department of Physics, POSTECH, Pohang, Korea, NICK WAKEHAM, Los Alamos National Laboratory, Materials Physics and Applications Division, Los Alamos, New Mexico 87545, USA, NI NI, Department of Physics & Astronomy, UCLA, Los Angeles, California 90024-1769, USA, ERIC BAUER, Los Alamos National Laboratory, Materials Physics and Applications Division, Los Alamos, New Mexico 87545, USA, JEE-HOON KIM, CALDES, Institute of Basic Science, Pohang, Korea, Department of Physics, POSTECH, Pohang, Korea, FILIP RONNING, Los Alamos National Laboratory, Materials Physics and Applications Division, Los Alamos, New Mexico 87545, USA — We report thermal and transport properties of $U_2Pt_{1-x}Ir_xC_2$ from which a magnetic phase diagram is obtained. Pure U_2IrC_2 is an antiferromagnet at 6.5 K, whose Neel temperature initially rises to 13.2 K at x=0.8 and subsequently is suppressed to zero temperature with increasing Pt content near x=0.4. Heat capacity data at x=0.4 shows an upturn at low temperature, which is consistent with proximity to a quantum critical point and considered as non-Fermi liquid behavior. The entropy after the phonon contribution has been subtracted has a value of 0.18 $Rln2$ at the Neel temperature of U_2IrC_2, revealing an itinerant nature of the 5f electrons in this compound. On the Pt rich side of the phase diagram, superconductivity is suppressed by x=0.15. The residual resistivity increases by a factor of 10 from pure Pt (x=0) to x=0.15 where superconductivity is suppressed to zero. The phase diagram is compared to pressure tuned and Rh doped U_2PtC_2 demonstrating the role of electronic tuning in this system.

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