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Superconducting and Magnetic Properties of $\text{YNi}_2\text{B}_2\text{C}$ Single Crystal¹ K.J. SONG, Dept. of Physics, University of Tennessee, Knoxville, TN, J.R. THOMPSON, Oak Ridge National Laboratory, Oak Ridge, TN and Dept. of Physics, University of Tennessee, Knoxville, TN, D.K. CHRISTEN, D.G. MANDRUS, M. YETHIRAJ, Oak Ridge National Laboratory, Oak Ridge, TN, C.V. TOMY, D. MCK. PAUL, Dept. of Physics, University of Warwick, Coventry, UK | Complementary magnetization and heat capacity studies were conducted on a single crystal of $\text{YNi}_2\text{B}_2\text{C}$ superconductor. The 17 mg crystal was studied at temperatures T from above T_c (15 K) to 2-3 K, in magnetic fields $H \parallel c$ -axis from zero to $H > H_{c2}$, the upper critical field. The crystal exhibited little magnetic irreversibility, enabling an analysis of its equilibrium properties: the thermodynamic critical field $H_c(T)$, $H_{c2}(T)$, and the magnetization $M(H; T)$ in both the normal and superconductive states. The deduced values of the Ginzburg-Landau parameters ξ_1 and ξ_2 increase considerably as T decreases. This is consistent with the material's long electronic mean free path and the observation of non-local electrodynamics. In the normal state, the magnetization exhibits significant angular variation. These and other results will be discussed.

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