Abstract Submitted for the OSF07 Meeting of The American Physical Society

Photodetachment Spectroscopy of Ce⁻¹ A.P. SNEDDEN, R.L. FIELD III, C.M. JANCZAK, K.A. STAR, N.D. GIBSON, C.W. WALTER, Denison University, P. ANDERSSON, Gothenburg University — Tunable infrared laser photodetachment spectroscopy has been performed on Ce⁻ using a crossed laser-ion beam apparatus. The relative photodetachment cross section for neutral production was measured over the photon energy range 0.61 eV - 0.75 eV. The spectrum reveals a threshold near 0.65 eV, which is interpreted as the opening of Ce- the $(4f5d^26s^2 \ ^4H_{7/2})$ to Ce $(4f5d^26s^2 \ ^1G_4)$ ground state to ground state transition. At least five narrow peaks associated with negative ion resonances are observed over the range 0.62 - 0.70 eV, and their energies and widths are measured. The present measurements are compared to recent theoretical [1] and experimental [2] results, which are in significant disagreement on fundamental physical quantities such as the electron affinity of Ce and the ground state configuration of Ce⁻. [1] S.M. O'Malley and D.R. Beck, Phys. Rev. A 61, 034501 (2000); X. Cao and M. Dolg, Phys. Rev. A 69, 042508 (2004). [2] V.T. Davis and J.S. Thompson, Phys. Rev. Lett. 88, 073003 (2002).

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