

TWO-PHOTON IONIZATION STUDY OF THE LOW LYING STATES OF UN⁺

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The electronic structures of UN and UN⁺ are of interest for the testing and development of relativistic quantum chemistry methods. The ground state UN was probed by Matthew and Morse¹, who found that the electronic configuration (5f²7s) differed from that of the isoelectronic UO⁺ cation (5f³). In the present study we examine the ionization energy of UN and the low energy states of UN⁺ by means of pulsed-field ionization zero kinetic energy photoelectron spectroscopy (PFI-ZEKE). Resonantly enhanced two photon ionization (R2PI) coupled with a time of flight mass spectrometer was used to confirm production of the UN molecule and locate suitable electronically excited states for subsequent access to UN⁺ via high-n Rydberg states. The results will be compared to the predictions from ligand field theory and high-level ab initio calculations.

1. D. J. Matthew and M. D. Morse, *J. Chem. Phys.* 138, 184303 (2013)