

Fine-structure resolved photoionization of metastable Be-like ions C III, N IV, and O V

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Be-like ions offer a number of scientifically interesting aspects. With the two loosely bound electrons in the L-shell and two tightly bound K-shell electrons, they are almost perfect objects for investigating two-electron effects. The metastable 3P states can be easily populated and provide access to well isolated excited states which are known to be of high importance in the modeling of finite density plasmas. The present work aims at experimental distinction between the fine-structure levels of the 3P term. High-resolution photoionization experiments were carried out with beams of C^{2+} , N^{3+} , and O^{4+} containing roughly equal amounts of ground-state and metastable ions. The energy scales of the experiments are calibrated with uncertainties of 1 to 10 meV depending on photon energy. By employing energy resolutions of the order of 20000, cross section features characteristic for individual states 3P_0 , 3P_1 , 3P_2 and, of course, the 1S_0 ground state are observed.