Revised Analysis and Configuration Interaction in Mo VI

JOSEPH READER, NIST — Mo vi, with ground term 4p^6 4d^2 ^2D, has a simple one-electron spectrum 4p^6 nl-4p^5 n'l' as well as a more complex spectrum arising from inner-shell excitations 4p^5 4d^2 and 4p^5 4d^5s. A few years ago we observed the spectrum of Mo vi from 200 to 5300 Å with a sliding-spark and the 10.7-m normal- and grazing-incidence spectrographs at NIST. We revised a number of the known even levels of the one-electron spectrum [1] and confirmed the ionization limit [1], which was based largely on the Penning discharge observations of Romanov and Striganov [2]. A number of Romanov and Striganov’s line identifications were also revised. Our results have not yet been published. More recently, we revisited the 4p^6 (4d+5s)-4p^5 (4d^2+4d5s) transitions and revised several of the core-excited levels [3]. Some levels of 4p^5 4d^2 are highly mixed with one-electron levels, resulting in transitions at longer wavelengths between 4p^5 4d^2 and one-electron levels. This provides accurate connections between the ground term and some highly-excited levels and thus highly accurate Ritz-type wavelength predictions for resonance transitions. Improved values have been obtained for all of the energy levels and a new least-squares fit for the odd configurations carried out. [1] B. Edlén, et al., Phys. Scr. 32, 215 (1985). [2] N. P. Romanov and A. R. Striganov, Opt. Spectrosc. (USSR) 27, 8 (1969). [3] A. Kancerevicius et al., Lith. Phys. J. 31, 143 (1991). Supported by Office of Fusion Energy Sciences of D.O.E.