Abstract Submitted
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Energy structure and transition data of doubly ionized mercury: Hg III. AADIL RASHID, TAUHEED AHMAD, Aligarh Muslim University — The spectrum of doubly ionized mercury (Hg III) has been studied in the wavelength region of 400 - 2000Å. The Hg III is Au II like ion with its ground configuration $5d^{10}$ ($^1S_0$). The outer electron excitations are of the type $5d^9n\ell(n\geq5)$. Some low lying internal excitations $5d^86s^2$ and $5d^86s6p$ have also been reported along with $5d^9$ (6s, 7s & 6p) configurations. We are investigating particularly $5d^96d$ and $5d^98s$ configurations for missing levels with the aid of experimental recordings made on a 3-m normal incidence vacuum spectrograph using a triggered spark source. The spectra of 5d ion(s) are composite not only quantitatively but also qualitatively, due to the overlap of configurations. Their study requires high-resolution spectral instruments in the ultra-violet wavelength region as well as reliable methods for the interpretation of the spectra. The *ab-initio* calculations were carried out by means of R. D. Cowan's Hartree-Fock code with superposition of configurations and relativistic corrections to predict the energy eigenvalues as well as the associated wavelength and transition probabilities along with the cancellation factor. The entire analysis was freshly carried out and was found that earlier reported values were satisfactory except the levels of $5d^98s$ configuration. Only $^3D_3$ level of this configuration is being confirmed in the present work and the others were newly established. Final results were interpreted by least squares fitted parametric calculations. We have used Ritz extrapolation formula using a least squares fitting code RITZPL to calculate the ionization limit. With the three member $5d^9ns$ series, the ionization potential was found to be 278200 400 cm^{-1} (34.49 0.05eV).

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