Contribution ID: **14** Type: **not specified**

Spectroscopic study of excitation energies and radiative properties of N-like tungsten

Spectroscopic study of excitation energies and radiative properties of N-like tungsten

Arun Goyal

Shyam Lal College, Delhi University, Delhi-110032, India

Synopsis: In present work, fine structure energies and radiative data namely,transition wavelengths, transitions rates, oscillator strengths and line strengths have been presented for N-like W. We have systemati-cally analysed configuration interaction (CI) data and convergence in Dirac-Coulomb as well as Breit and Quantum electrodynamics (QED) effects of excitation energies. We have also discussed the evaluation of results from two independent codes GRASP and FAC.

In previous studies, atomic spectra of N-like W are not so well resolved and there is insufficiency of reliable and authentic atomic data for N-like tung-sten. Verdebout et al. [1] studied hyperfine struc-tures and lande g factors of N-like ions and other ions for few levels. Naze et al. [2] presented iso-tope shifts for N-like ions. Wang et al. [3] studied electron impact excitation using ICTF R-matrix. Xu et al. [4] reported excitation energies and tran-sition wavelengths for tungsten ions.
In present work, we have reported the energies for N-like W. We have presented the radiative data for electric dipole(E1), and magnetic quadru-pole(M2) transitions. We have studied the accura-cy of transition data on the basis accuracy indi-actor and also studied uncertainty in oscillator strength for E1 and M2 transitions. To study the contribution of configurations belonging to differ-ent shells, we have increased the configuration set in systematic way as given below:
AS1 = {n=4, l=0-3}
AS2 = AS1 + {n=5, l=0-4}
AS3 = AS2 + {n=6, l=0-4}

AS4 = AS3 + {n=7, l=0-4}

By adopting this mechanism, we have also studied convergence as well as effect of configuration in-teraction (CI) on excitation energies. We have compared our results with available theoretical re-sults and discussed discrepancy with results com-piled by NIST.
It has been observed that our results are in good agreement with other results and there is no large significant discrepancy. But our results are more close to NIST.

Further details of the results and calculations for excitation energies and radiative data for N-like W will be presented at the conference.

References
[1] S. Verdebout et al 2014 ADNDT 100 1111
[2] C. Naze et al 2014 ADNDT 100 1197
[3] H. Wang et al 2018 ADNDT 120 373
[4] M. Xu et al 2016 Can. J. Phys 94 563

- E-mail: arun.goyal.du@gmail.com

Presenting Author

Arun Goyal

Presenting Author Affiliation

Shyamlal College

Presenting Author Gender

Male

Country

India

Presenting Author Email Address

arun.goyal.du@gmail.com

Author: Dr GOYAL, Arun (University of Delhi)

Presenter: Dr GOYAL, Arun (University of Delhi)

Session Classification: Poster Session

Track Classification: Fundamental Data and Modelling