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REVIEWER'S REPORT

Manuscript No.: IJAR-56164

Title:
Modified Atomic Orbital Theory Applied to the Study of (3d94s 3D3,2,1)*n*p and the (3d94s 1D2)*n*p Rydberg series of Cu-like Zn+.

Recommendation:
Accept as it is .....
Accept after minor revision.....
Accept after major revision .....
Do not accept (*Reasons below*) .....

Rating	Excel.	Good	Fair	Poor
Originality		Good		
Techn. Quality	Excellent			
Clarity	Excellent			
Significance	Excellent			

Reviewer Name:Dr. Sumathi

Detailed Reviewer's Report

1. **Photoionization is a physical process where an atom or molecule absorbs a high-energy photon (typically ultraviolet or X-ray) and ejects one or more bound electrons, transforming the neutral particle into a positively charged ion. It is essential for atmospheric chemistry, creating plasma in space, and detecting volatile organic compounds (VOCs) .**
2. **Resonance energy is the extra stability gained by a molecule due to electron delocalization, represented as the energy difference between the actual resonance hybrid and its most stable Lewis structure. It signifies a lower, more stable energy state compared to a hypothetical localized model, with higher values indicating greater stability, especially in aromatic compounds.**
3. **In laser engineering, the quantum defect is the unavoidable energy difference between absorbed pump photons and emitted laser photons, typically lost as heat. This energy difference represents a fundamental limit to laser efficiency, as a higher quantum defect results in lower maximum power efficiency.**

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4. **Modified Atomic Orbital Theory (MAOT) is a quantum mechanical approach used to calculate atomic properties by adjusting traditional orbital parameters—such as effective nuclear charges and screening constants—to better account for electron repulsion in ions and environmental effects. It provides improved accuracy for autoionizing Rydberg series, photoionization data, and molecular structure calculations compared to standard, free-atom atomic orbital methods.**
5. **A Rydberg Series refers to the distinct sets of spectral lines (wavelengths of light) emitted or absorbed by atoms when an electron transitions between high-energy quantum levels, described by the Rydberg formula, which shows these energy levels converge towards an ionization limit, with series like Lyman, Balmer, Paschen, etc., corresponding to different final energy levels. These series demonstrate the quantized nature of atomic energy, where each series converges to a specific ionization threshold for a given core configuration, with the lines getting closer together at higher energies.**
6. **Synchrotron radiation is high-intensity electromagnetic radiation emitted when charged particles (usually electrons) are accelerated to near-light speeds and forced to travel in a curved path by magnetic fields. Produced in specialized synchrotron rings, this broadband radiation spans from infrared to X-rays. It is highly polarized, collimated, and used for advanced imaging and analysis in research.**
7. **Key words are good with significant points.**
8. **Result and discussion part should be in separate.**
9. **Result part for tables should make pie chart.**
10. **Summary points must be included.**
11. **References should ad some more with discussion points.**
12. **After those changes good to publish in your journal.**