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| Book Name: | **Plasmas Afterglows with N2 for Surface Treatments synthesis 2024** |
| Manuscript Number: | **Ms\_BPR\_** **3686.2** |
| Title of the Manuscript:  | **Active Species in R (He,Ne,Ar)-Molecular Gas Plasmas** |
| Type of the Article | **Book chapter** |

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| PART 1: Review Comments |
| Compulsory REVISION comments | Reviewer’s comment | Author’s Feedback *(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)* |
| **Please write a few sentences regarding the importance of this manuscript for the scientific community. Why do you like (or dislike) this manuscript? A minimum of 3-4 sentences may be required for this part.** | **Active species in rare gas (R = He, Ne, Ar)-molecular gas plasmas play crucial roles in determining the chemical and physical processes in such plasmas. These species are often the agents of energy transfer, ionization, and chemical reaction, which are essential for applications ranging from plasma processing to environmental remediation.** **By carefully controlling the plasma parameters and the composition of rare gas-molecular gas mixtures, these active species can be optimized for a variety of scientific, industrial, and environmental applications.** |  |
| **Is the title of the article suitable?****(If not please suggest an alternative title)** | **Yes relevancy is there** |  |
| Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here. | **The Abstract shows comprehensiveness in discussing the methods to obtain the plasma gas temperatures from the rotational structures of N2, CN, OH, H2 and O2 radiative states.** **The analysis presented highlights the critical roles of three-body reactions, vibrational excitation, and radiative states in high-pressure glow discharges, along with the methods to deduce plasma gas temperatures.** |  |
| **Are subsections and structure of the manuscript appropriate?** | **All the subsections are clearly given** |  |
| **Please write a few sentences regarding the scientific correctness of this manuscript. Why do you think that this manuscript is scientifically robust and technically sound? A minimum of 3-4 sentences may be required for this part.** | **The plasma gas temperature can be estimated from the rotational structures of molecular emissions, as rotational states are strongly coupled to the translational temperature of the gas.** **This discussion highlights the interplay of three-body reactions, vibrational state excitations, and methods of plasma diagnostics in helium-based glow discharges. Using actinometry and rotational spectroscopy of molecular species such as N2​, CN, OH, H2​, and O2​, precise information about gas temperatures can be extracted, contributing to the optimization of plasma-based processes.** |  |
| **Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.****-** | **The Author can give more references which are recent.That will suite the findings and conclusion.** |  |
| Minor REVISION commentsIs the language/English quality of the article suitable for scholarly communications? | **No issues.** |  |
| Optional/General comments | Care should be given in Alignment and Typing as well as numbering the equations.Try to maintain the continuity of the equations. |  |

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| **PART 2:**  |
|  | **Reviewer’s comment** | **Author’s comment *(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)*** |
| **Are there ethical issues in this manuscript?**  | ***(If yes, Kindly please write down the ethical issues here in details)*** |  |

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| **Reviewer Details:** |
| **Name:** | **M.Yegammai** |
| **Department, University & Country** | **Bharathiar University, India** |