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| Book Name: | **Plasmas Afterglows with N2 for Surface Treatments synthesis 2024** |
| Manuscript Number: | **Ms\_BPR\_3686.16** |
| Title of the Manuscript: | **Density of N2 Active Species in N2 –xCH4 Afterglows with x= (0-7.5)10-4 by Mass Spectrometry and Optical Spectroscopy at Low Gas Pressure** |
| Type of the Article | **Complete 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.** |  |  |
| **Is the title of the article suitable?**  **(If not please suggest an alternative title)** |  |  |
| 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. |  |  |
| **Are subsections and structure of the manuscript appropriate?** |  |  |
| **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.** |  |  |
| **Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.**  **-** |  |  |
| Minor REVISION commentsIs the language/English quality of the article suitable for scholarly communications? |  |  |
| Optional/General comments | Reviewer : "Density of N2 Active Species in N2 –xCH4 Afterglows with x= (0-7.5)10-4 by Mass Spectrometry and Optical Spectroscopy at Low Gas Pressure".  ABSTRACT (The density of N-atoms in N2 pink and late microwave flowing afterglows has been investigated by mass spectrometry and NO titration. By optical spectroscopy, it has been obtained after NO titration the density of N2(B,11), N2(C,0) and N2+(B,0)) radiative states and of N2(A), N2+ metastable and ionic molecules. " named manuscript I reviewed it as a referee.) I believe that if it is published, it will contribute to the scientific literature and scientists and will be beneficial. However, it would be appropriate to check the compliance of the Book Chapter. with English grammar rules by an academic whose native language is English. In addition to the number of references should be increased by adding new sources to the references. I think that this study is an important. In order to increase the quality of the the Book Chapter and to offer a wider perspective to the readers;  Reviewer comment 1: Please specify color and physical form in the characterization part.  Reviewer comment 2: It is necessary to increase and update the number of references by  adding some latest references.  Reviewer comment 3: To correct grammatical errors, it should be read by someone with good English and grammatical errors should be corrected.  Reviewer comment 4: should be to give more explanation for this (The NO molecules introduced for the NO titration can be consumed not only by N atoms but also by other active species 24, giving apparently higher N-atom density).  Reviewer comment 5: It is necessary to give a more explanatory detail of this sentence: (introducing some CH4 into N2, the density of the C atoms added to the N atoms is saved in the pink N2 states).  Reviewer comment 6 :In conclusion, from these results that you found\*\* we found in the range of 1015 cm-3, a density of N atoms 50% higher by titration of NO compared to mass spectrometry. By optical spectroscopy, we obtained by titration of NO the density of radiative states N = 2 1015cm-3 , of N2(B,11) = 2108cm-3, of N2(C,0) = 106cm-3 and N2+(B,0) = 7 106 cm-3 and of N2(A) = 31013cm-3, of N2+= 21011cm-3 of metastable and ionic molecules with a pink remanence of 95% and a late remanence of 5%.  By introducing CH4 into N2, the density of C atoms changed from pink to late remanence, while conversely the density of N atoms decreased\*\*.  Materials for Gas Pressure N2 storage should be proposed.  By minor revision, I am of the opinion that the book chapter can be suitable for acceptance. |  |

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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: | **Rafik Abdellatif** |
| Department, University & Country | **Morocco** |