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| Journal Name: | [**Asian Journal of Applied Chemistry Research**](https://journalajacr.com/index.php/AJACR) |
| Manuscript Number: | **Ms\_AJACR\_139812** |
| Title of the Manuscript: | **Theoretical investigation on mechanism and kinetics of M2CAA initiated by Cl atom in the atmosphere** |
| Type of the Article | **Original Research Article** |

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| PART 1: Comments | | |
|  | Reviewer’s comment **Artificial Intelligence (AI) generated or assisted review comments are strictly prohibited during peer review.** | **Author’s Feedback** (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. A minimum of 3-4 sentences may be required for this part.** | This article presents the first in-depth theoretical study of the atmospheric degradation reaction of methyl 2-chloroacetoacetate (M2CAA) by chlorine (Cl) radicals. This compound, belonging to the carbonyl ester family, is an oxygenated volatile organic compound (OVOC), widely used in the chemical industry (antimicrobials, pesticides, organic syntheses). The research estimates M2CAA's atmospheric lifetime at around 1.85 days, highlighting its potential for persistence in the atmosphere. This makes it possible to assess its effects on air quality and its transformation into potentially more harmful compounds. The results of this study enrich the databases of kinetic and thermodynamic parameters, essential for atmospheric chemistry models. | No correction is needed. |
| **Is the title of the article suitable?**  **(If not please suggest an alternative title)** | **Yes** | No correction is needed. |
| 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. | **Yes, the abstract is comprehensive, but the objectives of the study should be clearly stated in the abstract** | The objective of present study is incorporated in revised manuscript as per reviewer’s suggestion. |
| Is the manuscript scientifically, correct? Please write here. | Yes | No correction is needed. |
| **Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.** | **Not enough, many more recent references should be included if possible** | Necessary correction is made in revised manuscript. |
| Is the language/English quality of the article suitable for scholarly communications? | Yes | **No correction is needed.** |
| Optional/General comments | **The objectives of the study should be clearly set out in the abstract**  **The authors should clearly explain the environmental consequences of M2CAA in the atmosphere**  **Better explain the word thermochemistry in the context of the study for a better understanding**  **Many more recent references should be included if possible** | Necessary correction is made as per reviewer’s suggestion. |

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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)* | No ethical issues has been reported in this manuscript. |