N_2O AS AN O(^{1}D) SOURCE FOR GAS PHASE STUDY OF COMS

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Gas phase O(^{1}D) insertion reactions are a useful laboratory tool for the spectroscopic study of transient species that are believed to exist in extreme environments, such as star-forming regions of the interstellar medium. One of the most common and efficient methods of O(^{1}D) production is the photolysis of ozone (O_3) at 248 nm. However, previous studies in our group have revealed that numerous side products are generated because of the high reactivity of O_3 and $O_2(^1\Delta)$. Here we present modelling that demonstrates the feasibility of N_2O as an alternative to O_3 as an O(^{1}D) precursor. Using the Framework for 0-Dimensional Atmospheric Modelling (F0AM), we show that the number of unwanted side products should be reduced owing to the absence of O_3 and $O_2(^1\Delta)$. Additionally, we present initial laboratory experiments utilizing N_2O as an O(^{1}D) precursor to produce CH_3OH from CH_4 via O(^{1}D) insertion.