Abstract Submitted
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Photodissociation-Photoionization of Bromomethanes[1] JUAN C. POVEDA[2], ALFONSO GUERRERO, IGNACIO ÁLVAREZ, CARMEN CISNEROS, Instituto de Ciencias Fisicas - UNAM, LEAM - ESCUELA DE QUíMICA - UIS COLLABORATION — Molecular photodissociation – photoionization of bromomethanes were measured employing the laser-time of flight technique. By using molecular beams of different bromomethanes produced by adiabatic expansion (CH_2Br_2, $CHBr_3$, CBr_4), interacting with laser radiation of 266 and 355 nm from a Nd:YAG, pulse widths of 3.5-4.5 and 5.5-6.5 ns, respectively; and intensities of the order of 109 to 1010 Wcm^{-2}. Ions resulting of the interaction molecule-photon processes were analyzed using an R-ToF mass spectrometer. At the intensities of radiation used in the experiments, multiphoton processes are possible. From experimental data, was observed that the bromomethanes fast dissociate previous to the ionization, and molecular parents ions were no detected at the used wavelengths. The main detected ions correspond to H^+. C^+, CH^+, Br^+, CBr^+, $CHBr^+$, and Br_2^+. These are the result of molecular dissociation when the original molecules absorb one photon forming neutral radicals, absorption of additional photons produces the ionization. From experimental data, we could calculate the number of absorbed photons needed to the ionization processes, being it of the order of two and three photons at 266 nm, three, and four at 355 nm. Detected ions and the precursors play an important role in the chemistry and physics of the atmosphere; they can interact with water and ozone molecules, evolving in the deterioration of the air quality.

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