Study of the UV photochemistry of CH_3I trapped in cryogenic matrices and on water ice. Study of MBTCA (3-methyl-1,2,3-butanetricarboxylic acid) trapped in cryogenic matrices. Two molecules of atmospheric interest.

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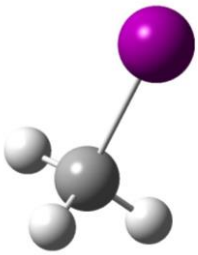
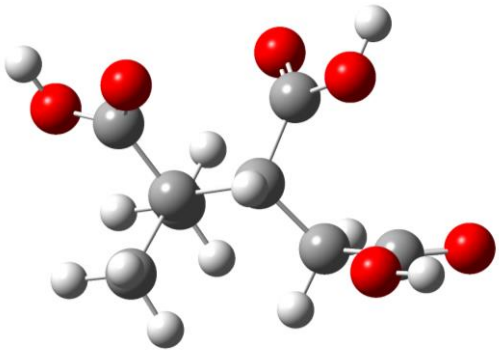
CH_3I and MBTCA are two molecules of atmospheric interest. However, they are not involved in the same processes. The former is an alkylating agent (i.e., it can alter DNA) and is present in trace amounts on the surface of seas and oceans. However, in the event of a major nuclear accident, such as Chernobyl or Fukushima, it can be released in large quantities and become radioactive. It can re-enter the atmospheric cycle, particularly by complexing with water in gaseous, liquid (aerosols) or solid (amorphous or crystalline ice) form.

MBTCA (3-methyl-1,2,3-butanetricarboxylic acid) is the end product of the degradation (by photochemical aging and water complexation) of terpenes such as alpha- and beta-pinene emitted by coniferous trees. It is a triacid responsible for acid rain. Again, water plays an important role in the aging and transport processes.

One of the most effective ways to study the early stages of hydration of these species remains cryogenic matrices, which by extension lead to water ice. This is the main thrust of the work to be presented, coupled with theoretical chemical calculations.



CH_3I



MBTCA