

UV Photochemistry of Acetylacetaldehyde trapped in four Cryogenic Matrices

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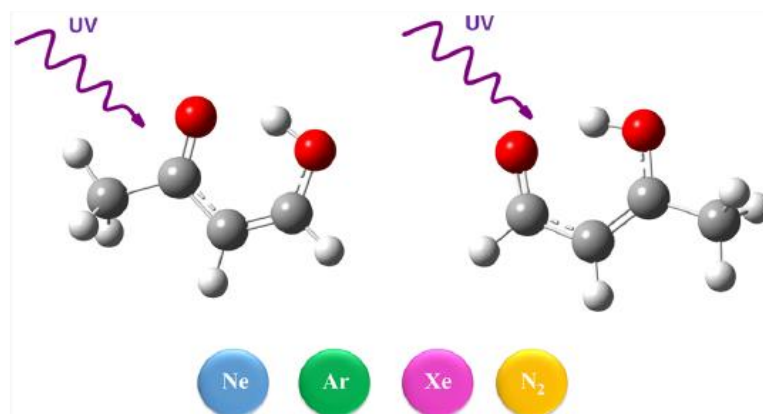
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Acetylacetaldehyde¹ is one of the simplest molecules, along with malonaldehyde² and acetylacetone³, that exhibits intramolecular proton transfer. While malonaldehyde shows a purely singlet electronic relaxation after UV irradiation, acetylacetone, on the other hand, shows a relaxation by triplet state. To find out whether this difference is due to the coupling between the two methyls of acetylacetone, we undertook a study of the UV photochemistry of acetylacetaldehyde, which contains only one methyl. Acetylacetaldehyde was trapped in 4 cryogenic matrices, Ne, Ar, Xe and N₂, and its broadband UV photochemistry was followed by IR and UV spectroscopies. We tried to detect heavy atom or oxygen quenching effects to identify a triplet state transition.



¹ Rousselot-Paillet, P. ; Sobanska, S.; Ferré, N.; Coussan, S. UV Photochemistry of Acetoacetaldehyde Trapped in Cryogenic Matrices. *J. Phys. Chem. A* **2020**, *124*, 4916-4928.

² Trivella, A. ; Wassermann, T.N.; Manca Tanner, C.; Lüttschwager, N.O.B.; Coussan, S. UV and IR Photochemistries of Malonaldehyde Trapped in Cryogenic Matrices. *J. Phys. Chem. A* **2018**, *122*, 2376-2393.

³ Trivella, A. ; Wassermann, T.N.; Mestdagh, J.M.; Manca Tanner, C.; Marinelli, F.; Roubin, P.; Coussan, S. New insights into the photodynamics of acetylacetone: isomerization and fragmentation in low temperatures matrixes. *PCCP* **2010**, *12*, 8300-8310.