PHOTOCHEMISTRY OF BIACETYL-d_6 ISOLATED IN INERT GAS MATRICES

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We report the results of ultraviolet photolysis of biacetyl-d_6 ($(CD_3CO)_2$) trapped in solid nitrogen, argon, and krypton. The infrared spectra obtained prior to photolysis are in agreement with the gas phase results obtained by Durig and coworkers [a]. The photoproducts were characterized via infrared spectroscopy. Irradiation at 405 nm results in the production of CO, CD_3CO, and CD_3, which are the photoproducts expected from gas phase biacetyl-h_6 studies at this wavelength [b]. Recombination of the trapped photoproducts leads to the production of other species not observed in the gas phase photolysis, including ketene-d_2 (CD_2CO) and acetaldehyde-d_4 (CD_3CDO). Mechanisms for the production of these and other secondary photoproducts will be discussed.

[a] J. R. Durig, S. E. Hannum, S. C. Brown, J. Phys. Chem. 75, 1946 (1971).
[b] G. F. Sheats, W. A. Noyes, Jr., J. Am. Chem. Soc. 77, 1421 (1955).