

FLUOROCARBONS IN SATELLITE PLUMES: THE PHOTOSYNTHESIS AND FLUORESCENCE FROM TRIFLUOROMETHYL RADICAL.

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Detailed information on the absorption and emission spectra of satellite plume constituents is lacking. Fluorocarbons are used as a space vehicle propellant in cold gas and pulsed plasma thrusters. Consequently, these uses likely produce small fluorocarbon radicals through pyrolysis and solar driven photolysis. Specifically, it's been shown that certain VUV wavelengths can produce electronically excited CF_3 radicals from parent fluorocarbons,^a but it has not been shown if ground state CF_3 radicals may be produced as well. Furthermore, the CF_3 radical's laser induced fluorescence spectrum has never been reported. Here we investigate the photosynthesis of CF_3 radical from VUV excitation of fluorocarbons, the direct fluorescence from the CF_3 radical, and the radical's relevance in the space environment.

^aWashida, N., Suto, M., Nagase, S., Nagashima, U., Morokuma, K., *J. Chem Phys.* 78, 1025, (1983).