reaction. Conversely, the addition of molecular oxygen increases the ethylene quantum yield from 0.14 to 0.38 at a total pressure of 1 Torr.

From these results it is not obvious what mechanism is responsible for such an effect. However, the involvement of excited *triplet* intermediates may be assumed:

$$^1CH_3CH_2C{\equiv}CH^* \rightarrow {}^3C_2H_4 + {}^3C_2H_2(?) \quad (1)$$

$$^3C_2H_4 + {}^3O_2 \rightarrow {}^1C_2H_4 + {}^1O_2 \ldots \quad (2)$$

Direct absorption of a photon leads to the formation of a *singlet* excited molecule. This excited molecule decomposes into two *triplet* excited molecules etc. Triplet–triplet annihilation processes are well known in the liquid phase but are not often included in gaseous chemical systems.

Collision-induced radiationless transitions in CS_2

A. CABELLO and J.A. DUEÑAS

Departamento de Química-Física, Facultad de Química, Universidad Complutense, Madrid 3 (Spain)

We measured the quenching rate constants of CS_2 vapour ($^1A_2$ and $^3A_2$ states) by laser-induced fluorescence with the gases CS_2, CO_2, O_2, NO, C_2H_5OH, CH_3OH, $C_2H_5NO_2$, CCl_4 and CH_3CN. The emission was measured in regions centred at 4480 and 5860 Å. The quenching cross sections were obtained for both electronic states. Stern–Volmer plots at 4480 Å for the $^3A_2$ state show saturation effects for CH_3CN, $C_2H_5NO_2$ and O_2, whereas only O_2 produces such effects at 5860 Å. The quenching cross sections correlate with the molecular parameters defined in the Thayer–Yardley model for collision-induced radiationless transitions. The decay of CS_2 obeys this model for the two states involved.

Energy selection experiments in glassy matrixes: the fluorescence spectrum of isobacteriochlorin

FRITZ BURKHALTER and URS P. WILD

Physical Chemistry Laboratory, Swiss Federal Institute of Technology, CH-8092 Zürich (Switzerland)

The fluorescence spectrum of a synthetic isobacteriochlorin 1 was studied in a glassy matrix at low temperature. It consists of a single strong 0–0 band and very little vibronic structure. Excitation into a region 400 - 900 cm^{-1} above the