HIGH RESOLUTION STIMULATED RAMAN SPECTROSCOPY OF CARBON TETRAFLUORIDE CF_4

V. BOUDON, *Laboratoire Interdisciplinaire Carnot de Bourgogne, UMR 6303 CNRS-Université de Bourgogne, 9. Av. A. Savary, BP 47870, F-21078 Dijon Cedex, France*; D. BERMEJO, R. Z. MARTÍNEZ, *Instituto de Estructura de la Materia, CSIC Serrano 123, E-28006 Madrid, Spain*.

The spectra of the ν_1, ν_2 and $2\nu_2$ bands were obtained with a quasi-cw stimulated Raman spectrometer. In this technique, two laser beams are focused simultaneously on the sample and their frequency difference scanned, normally by scanning one of them. When this difference matches a Raman transition of the molecule under study, an energy transfer takes place between both beams, so that by monitoring the intensity of one of them throughout a frequency scan a Raman spectrum of the sample can be obtained. In a quasi-cw spectrometer one of the laser beams is continuous and the other one pulsed, providing an optimum compromise between resolution and sensitivity. The apparatus function results from the convolution of the linewidths of the two lasers. In our setup this function is dominated by the contribution of the pulsed beam, resulting in a FWHM of $\sim$ 75 MHz, which sets the limit to the resolution of the spectrometer.

The three bands analyzed in this work were studied at a temperature of 135 K. The spectrum of ν_1 was obtained at a sample pressure of 2 mbar. For the spectra of $2\nu_2$ and ν_2, which are much weaker, pressures of 15 and 20 mbar respectively were used. The analysis has been performed thanks to the XTDS and SPVIEW softwares developed in Dijon for such molecules[a].

[a] Ch. Wenger, V. Boudon, M. Rotger, M. Sanzharov and J.-P. Champion, *J. Mol. Spectrosc.*, **251** 102–113 (2008).