SPIN-ROTATION INTERACTIONS IN CHLOROMETHYL RADICAL

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Velocity collimation in the slit supersonic discharge expansion results in a strong reduction in residual Doppler broadening, which makes possible resolution of spin-rotation fine structure in open shell radicals in the near infrared. By way of example, spin-rotation splittings in the vibrational ground and excited state have been observed in the ro-vibrational spectrum of the symmetric C-H-vibration ($3055.07723(63)\,\mathrm{cm}^{-1}$)of chloromethyl radical, for both $K = 0$ and 1 nuclear spin species. Rovibrational line shapes have been fitted to a spin-rotation Hamiltonian, including rotational-asymmetry splitting as well as hyperfine interactions. Spin-rotation coupling constants have been obtained for the vibrational excited state, with ground state values taken from microwave spectra.[a]

[a] Y. Endo, S. Saito, E. Hirota, Can. J. Phys. 62, 1347 (1984)