FOURIER-TRANSFORM MICROWAVE SPECTROSCOPY OF THE CCCl RADICAL

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Pure-rotational transitions of CCCl, a chlorine derivative of CCH, have been observed for the first time by Fourie-transform microwave spectroscopy. The radical has been considered to be a possible candidate for an interstellar molecule as mentioned by Guelin et al [a]. The radical was produced in a supersonic jet by a pulsed electric discharge of CCl_4 diluted to 0.3% with Ne. Rotational transitions corresponding to $N = 1 - 0$ and $N = 2 - 1$ with spin splittings were observed for isotopomers, $CC^{35}Cl$ and $CC^{37}Cl$. It turned out that the radical has a $^2\Sigma$ symmetry in the ground state as the case of CCH. Hyperfine splittings due to the Cl nucleus were also observed in the spectrum. The molecular constants have been precisely determined for these two isotopomers. An *ab initio* calculation has revealed that a $^2\Pi$ state is very close to the Σ state, and the two states are much more strongly interacting with each other than the case of CCH. Discussion on the vibronic-interaction as well as the linearity of the radical in the gournd state, based on the determined molecular constants and the results of the *ab initio* calculation, will be given in this talk. Although, transition frequencies calculated using the determined molecular constants did not coincide with the reported U-line frequencies[b], it now becomes possible to detect the radical in the interstellar space based on the present results.

[a] M. Guelin, J. Cernicharo, C. Kahane, and J. Gomez-Gonzalez, Astron. Astrophys. 157, L17 (1986).
[b] F. J. Lovas, J. Phys. Chem. Ref. Data. 21, 181 (1992).