IMPROVED ANALYSES OF INFRARED AND VISIBLE EMISSION SPECTRA OF THE H_3 AND D_3 MOLECULES

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Electronic emission spectra of the neutral H_3 and D_3 molecules obtained with a Droege-Engelking[a] corona discharge source were described at a previous symposium.[b] The present work is concerned with analyses of these data for the complex of $3d$, $3s$, and $3p_0$ upper states, where the symbols mean nl_λ. The lower states are $3p_1$ (for the infrared) and $2p_0$ (for the visible). In H_3 a $(3s, 3d_0)$ perturbation is recognised, in addition to the $(3p_0, 3d_1)$ perturbation discussed previously.[c] The decreased interference by H_2 or D_2 in these spectra has made it possible to improve the lower-state combination differences and constants. However, the standard deviations in the fits of the upper states of both H_3 and D_3 are still quite large. This is possibly due to numerous small perturbations by background states. It would also be desirable to replace the present effective Hamiltonians by a variational-type treatment of centrifugal effects.

[a] A. T. Droege and P. C. Engelking, *Chem. Phys. Lett.* **96**, 316 (1983).
[b] Paper TA12 (1991).
[c] G. Herzberg, J. T. Hougen, and J. K. G. Watson, *Can. J. Phys.* **60**, 1261 (1982)