

IMPROVED ANALYSES OF INFRARED AND VISIBLE EMISSION SPECTRA OF THE H₃ AND D₃ MOLECULES

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Electronic emission spectra of the neutral H₃ and D₃ 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 3*d*, 3*s*, and 3*p*₀ upper states, where the symbols mean *nl*_λ. The lower states are 3*p*₁ (for the infrared) and 2*p*₀ (for the visible). In H₃ a (3*s*, 3*d*₀) perturbation is recognised, in addition to the (3*p*₀, 3*d*₁) perturbation discussed previously.^c The decreased interference by H₂ or D₂ 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 H₃ and D₃ 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.

^aA. T. Droege and P. C. Engelking, *Chem. Phys. Lett.* **96**, 316 (1983).

^bPaper TA12 (1991).

^cG. Herzberg, J. T. Hougen, and J. K. G. Watson, *Can. J. Phys.* **60**, 1261 (1982)