

JET AND LASER OPTOGALVANIC STUDIES OF THE ELECTRONIC SPECTRA OF GeH₂ AND GeD₂ AND AN IMPROVED STRUCTURE FOR GERMYLENE

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In 1995, we reported the structure of GeH₂, based on the assignment of 16 rotational lines in the LIF spectrum of the 0₀⁰ band of the $\tilde{A}^1B_1 - \tilde{X}^1A_1$ electronic transition.^a The number of observed rotational transitions was severely limited by an inhomogeneous predissociation in the excited state. We have now recorded high resolution LIF spectra of the 0₀⁰ band of jet-cooled GeD₂ using the pulsed discharge technique with a GeD₃Cl precursor. The spectrum is much more extensive than that of GeH₂ due to less efficient tunneling through the barrier to dissociation on deuteration. Portions of the room temperature 0₀⁰ band absorption spectrum of GeH₂ have also been studied at Doppler-limited resolution using the laser optogalvanic technique. Rotational analysis of these spectra has provided the ground and excited state rotational constants for several germanium isotopomers. These data have been used to obtain an improved structure for germylene.

^aJ. Karolczak, W. W. Harper, R. S. Grev, and D. J. Clouthier, *J. Chem. Phys.* **103**, 2839 (1995).