

REANALYSIS OF THE $a^4\Sigma^- - X^2\Pi_r$ TRANSITION OF GeH USING INTRACAVITY LASER SPECTROSCOPY

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The spin-forbidden $a^4\Sigma^- - X^2\Pi_r$ transition of germanium hydride, GeH, was reported in emission in 1953 by Kleman and Werhagen. In our study, Intracavity Laser Spectroscopy, ILS, was used to obtain the first high resolution spectrum of this transition between $15,000\text{ cm}^{-1}$ and $16,500\text{ cm}^{-1}$. The GeH molecules were produced in the plasma discharge of an Al-plate electrode, using 800 mTorr H_2 and 600 mTorr of GeH_4 . The plasma was formed within the cavity of a tunable dye laser system, and the molecular absorption features are enhanced during an initial generation time prior to detection. The cathode length was 150 mm, the laser cavity was 1.15 m long, and a generation time of 180 μsec was used, resulting in an effective pathlength of 7 km. The spectra were collected intermittently with those from an external I_2 cell, and the spectra were calibrated using PGOHPER and the Doppler-limited I_2 spectrum of Salami and Ross. The obtained line positions were fit using PGOPHER. Results of the analysis will be presented.