OBSERVATION AND SPECTRAL ANALYSIS OF THE A Ω=1 – X Ω=0^+ ELECTRONIC TRANSITION OF DIATOMIC PLATINUM SULFIDE, PtS, BY INTRACAVITY LASER ABSORPTION SPECTROSCOPY WITH FOURIER TRANSFORM DETECTION (ILS-FTS)

LEAH C O'BRIEN, *Department of Chemistry, Southern Illinois University, Edwardsville, IL, USA*; JACK C HARMS, JAMES J O'BRIEN, *Chemistry and Biochemistry, University of Missouri, St. Louis, MO, USA*; WENLI ZOU, *Institute of Modern Physics, Northwest University, Xi'an, China*.

Using ILS-FTS, we have recorded the A Ω=1 – X Ω=0^+ transition of diatomic PtS. Strong bands were observed at 15,520 and 15,910 cm^{-1}, which have been identified as the (0,0) and (1,0) vibrational bands. The P- and R-branches show a regular pattern for the ^{194}PtS, ^{195}PtS, ^{196}PtS and ^{198}PtS isotopologues, but quite interestingly the Q-branch shows significant hyperfine splitting for ^{195}PtS. Although P- and R-branches were easily assigned based on the known ground state constants, the Q-branch seems to be perturbed, requiring q, q_D, and q_H parameters to achieve only a sub-par fit. This indicates the presence of a nearby Ω=0^- state that is perturbing the f–levels in the A Ω=1 state. A successful deperturbation analysis and fit were performed in PGOPHER, and molecular constants for the A Ω=1 and perturbing Ω=0^- states were obtained. High-level $ab\ initio$ calculations support this assignment and predict an Ω=0^- state in close proximity to the A state. Results and discussion of this analysis will be presented.