

ROTATIONAL SPECTRA, BOND LENGTHS AND ^{195}Pt NUCLEAR SPIN-ROTATION CONSTANTS OF PtSi AND PtS

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The pure rotational spectra of 9 isotopomers of PtSi and 8 isotopomers of PtS have been recorded, in natural abundance, using Fourier transform microwave spectroscopy. For both species the $J = 1 \leftarrow 0$ and the $J = 2 \leftarrow 1$ transitions together with rotational transitions from vibrationally excited states were measured in the 8 - 20GHz frequency range. The spectra confirm that both molecules have $^1\Sigma^+$ ground states as deduced previously by electronic spectroscopy^{a,b}. The data sets obtained enabled multi-isotopomer fits to a Dunham-type expression which further enabled values for the equilibrium bond lengths for each species to be calculated. In the process of fitting both data sets it was necessary to include Born-Oppenheimer breakdown correction terms. In the ground vibrational state the nuclear spin-rotation constant, $C_I(^{195}\text{Pt})$, was found to be 30.98(157)kHz for $^{195}\text{PtSi}$ and -66.80(157)kHz for ^{195}PtS .

^aL. Shao, S. M. Sickafoose, J. D. Langenberg, D. J. Brugh and M. D. Morse *J. Chem. Phys.* **112**(9), 4118, 2000.

^bB. Z. Li, K. Y. Jung and T. C. Steimle *J. Mol. Spec.* **170**, 310-322, 1995.