

## HIGH RESOLUTION EMISSION SPECTROSCOPY OF THE VIBRATION-ROTATION BANDS OF HBO AND HBS.

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The vibration-rotation spectra of HBO and HBS have been investigated at high resolution using a Fourier transform spectrometer. The HBO molecules were produced in a high temperature furnace from the reaction of H<sub>2</sub>O vapor with boron by heating a mixture of crystalline boron and boron oxide (B<sub>2</sub>O<sub>3</sub>) at a temperature  $\sim 1350^{\circ}\text{C}$ . The spectra were recorded in the 1100–2200 cm<sup>-1</sup> and 1700–4000 cm<sup>-1</sup> wavenumber regions covering the  $\nu_3$  and  $\nu_1$  fundamentals, respectively. In total 24 vibrational bands involving 30 vibrational levels of H<sup>11</sup>BO and 12 bands involving 18 levels of H<sup>10</sup>BO have been rotationally analyzed. After combining the existing microwave and infrared measurements, the absolute term values have been determined for a number of vibrationally-excited states of H<sup>11</sup>BO and H<sup>10</sup>BO.

The HBS molecules were formed by the reaction of CS<sub>2</sub> and water vapor with crystalline boron at a temperature  $\sim 1300^{\circ}\text{C}$ . The spectra were recorded in the 850–1500 cm<sup>-1</sup> and 1750–4000 cm<sup>-1</sup> wavenumber regions covering the  $\nu_3$  and  $\nu_1$  frequency regions. In total 29 vibrational bands involving 33 vibrationally-excited levels of H<sup>11</sup>BS and 9 bands involving 12 vibrational levels of H<sup>10</sup>BS have been analyzed. The fitted spectroscopic parameters agree very well with the results of our *ab initio* calculations. *L*-resonance interactions observed between the 02<sup>0</sup>0 ( $\Sigma$ ) and 02<sup>2</sup>0 ( $\Delta$ ) levels of HBO and HBS were analyzed using a 2 $\times$ 2 matrix to yield deperturbed constants.

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