THE VIBRATION-ROTATION EMISSION SPECTRA OF GASEOUS ZnH_2 AND ZnD_2

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High resolution infrared emission spectra of gaseous ZnH_2 and ZnD_2 have been recorded with a Fourier transform spectrometer. The molecules were generated in an emission source that combines an electrical discharge with a high temperature furnace. The vibration-rotation emission spectra of ZnH_2 and ZnD_2 were recorded in the 1200-2200 cm^{-1} region at an instrumental resolution of 0.01 cm^{-1}. The antisymmetric stretching fundamental bands, 001-000, of $^{64}ZnH_2$ and $^{64}ZnD_2$ were observed near 1889.4 cm^{-1} and 1371.6 cm^{-1}, respectively, and for the minor isotopes of zinc, ^{66}Zn and ^{68}Zn, the band origins were shifted by approximately 1-2 cm^{-1}. Preliminary analysis of the spectra resulted in r_0 values of 1.535271(1) Å and 1.531833(9) Å for $^{64}ZnH_2$ and $^{64}ZnD_2$, respectively. Several hot bands of ZnH_2 involving ν_1, ν_2 and ν_3 have also been observed, and analysis of these bands will lead to an equilibrium structure (r_e) for ZnH_2. The results will be presented at the symposium.