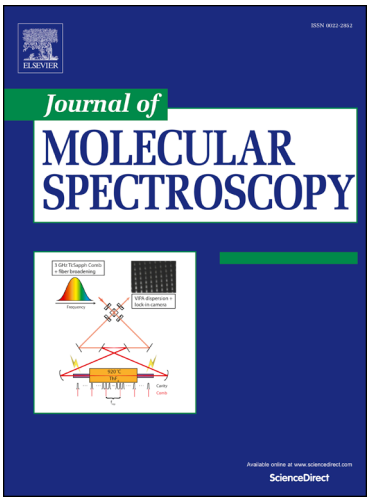

Fourier transform emission spectra of the $A^2\Pi \rightarrow X^2\Sigma^+$ and $B^2\Sigma^+ \rightarrow X^2\Sigma^+$ transitions of ZnD

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Fourier transform emission spectra of the $A^2\Pi \rightarrow X^2\Sigma^+$ and $B^2\Sigma^+ \rightarrow X^2\Sigma^+$ transitions of ZnD

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Abstract

High resolution emission spectra of ZnD have been recorded in the 18000 – 27000 cm^{-1} region using a Fourier transform spectrometer, and two electronic transitions have been observed. The $A^2\Pi \rightarrow X^2\Sigma^+$ data span the $v'' = 0$ to 6 levels of the $X^2\Sigma^+$ ground state, and the $v' = 0$ to 3 levels of the $A^2\Pi$ state. In the $B^2\Sigma^+ \rightarrow X^2\Sigma^+$ transition, the $v' = 0$ progression was observed for the first time, including the 0–4, 0–5, 0–6 and 0–7 bands. Local perturbations were observed between the $v' = 0$ levels of the $B^2\Sigma^+$ state and the $v' = 2$ and 3 levels of the $A^2\Pi$ state. Spectroscopic constants were determined for the $X^2\Sigma^+$, $A^2\Pi$ and $B^2\Sigma^+$ states of ^{64}ZnD from rotational analysis of the data. The equilibrium Zn–D bond distances (r_e) have been determined to be of 1.51176(1) and 2.26714(1) Å, for the $A^2\Pi$ and $B^2\Sigma^+$ states, respectively.