

## FOURIER TRANSFORM INFRARED SPECTROSCOPY OF THE $\text{H}_2\text{F}^+$ $\nu_1$ , $\nu_3$ AND $\nu_2$ BANDS

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Since HF is known as interstellar species, the protonated HF may exist with detectable abundance. Vibration-rotation spectra of  $\text{H}_2\text{F}^+$   $\nu_1$  and  $\nu_3$  bands were studied by infrared laser spectroscopy<sup>a</sup>. The  $\nu_2$  band and pure rotational spectra have not been reported. In this study, we report FTIR spectroscopy of  $\text{H}_2\text{F}^+$   $\nu_1$ ,  $\nu_3$  and  $\nu_2$  bands. The ion was produced with hollow cathode discharge in  $\text{F}_2$ , He and  $\text{H}_2$  mixture. A simultaneous analysis of FT data combined with laser spectroscopic data was carried out for  $\nu_1$  and  $\nu_3$  bands, to determine ground state molecular constants. Absorption lines in the  $\nu_2$  region were assigned by using the ground state combination differences. Determined molecular constants can be used to predict pure rotational transition frequencies.

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<sup>a</sup>E. Schäfer and R. Saykally, *J. Chem. Phys.* 81, 15 (1984)