FOURIER TRANSFORM INFRARED SPECTROSCOPY OF THE H_2F^+ ν_1, ν_3 AND ν_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 H_2F^+ ν_1 and ν_3 bands were studied by infrared laser spectroscopy[a]. The ν_2 band and pure rotational spectra have not been reported. In this study, we report FTIR spectroscopy of H_2F^+ ν_1, ν_3 and ν_2 bands. The ion was produced with hollow cathode discharge in F_2, He and H_2 mixture. A simultaneous analysis of FT data combined with laser spectroscopic data was curried out for ν_1 and ν_3 bands, to determine ground state molecular constants. Absorption lines in the ν_2 region were assigned by using the ground state combination differences. Determined molecular constants can be used to predict pure rotational transition frequencies.

[a]E. Schäfer and R. Saykally, J. Chem. Phys. 81, 15 (1984)