

ABSOLUTE LINE INTENSITIES AND VIBRATION-ROTATIONAL SPECTRA OF THE ν_3 FUNDAMENTAL TRANSITIONS OF HO₂ NEAR 9 μM

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In this work, accurate measurements on the line intensity of the HO₂ ν_3 transitions near 9 μm have been demonstrated. In the experiment, HO₂ is generated by flash photolysis of the flowing gas mixture of Cl₂/CH₃OH/O₂. Upon photolysis, Cl atom is produced and reacts with CH₃OH to form HCl and CH₂OH. CH₂OH further reacts with O₂ to generate HO₂ and HCHO. By employing synchronized two-color time-resolved dual-comb spectroscopy near 3 and 9 μm , high-resolution spectra of both HCl and HO₂ radical can be obtained simultaneously to further derive the absolute line intensity of HO₂ transitions. Moreover, the high-resolution spectral measurements of HO₂ from 1100 to 1150 cm^{-1} with a spectral resolution of $\sim 0.0005 \text{ cm}^{-1}$ are carried out by using spectrally interleaved, comb-mode-resolved dual-comb spectroscopy.