

FLUORESCENCE-DIP INFRARED SPECTROSCOPY OF METHOXY RADICAL

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The fluorescence-dip infrared (FDIR) spectrum of methoxy radical (CH_3O) has been recorded in the region $2875\text{-}2980\text{ cm}^{-1}$. Methoxy radical was produced by the photolysis of methyl nitrite (CH_3ONO) in a pulsed free-jet expansion. The laser induced fluorescence (LIF) spectrum obtained was characterized by a rotational temperature of $\sim 2\text{K}$. In the FDIR experiment, the UV excitation laser was tuned to the rotational transition, $N'=1, K'=0 \leftarrow J''=3/2, P''=3/2$ of the $\tilde{A}^2A_1 \leftarrow \tilde{X}^2E_{3/2}, 0-0$ band. Two IR sources were used to deplete the ground-state level: difference frequency mixing and an optical parameter oscillator (OPO). The FDIR spectrum is detected as dips in fluorescence as a function of IR frequency. The correlation between the FDIR spectrum, the IR absorption spectrum,^a the stimulated emission pumping (SEP) spectrum and the dispersed fluorescence (DF) spectrum will be discussed.

^aJia-xiang Han, Yu. G. Utkin, Hong-bing Chen, L. A. Burns, and R. F. Curl, *J. Chem. Phys.* **117**, 6538, (2002)