

ROTATIONAL SPECTRA OF FIVE COMMON INHALATION ANESTHETICS

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The rotational spectra of five common inhalation anesthetics used during surgical procedures have been surveyed between 10 and 20 GHz using a Fourier-transform microwave (FTMW) spectrometer. The anesthetics are desflurane ($\text{CF}_2\text{HOCHF}_3$), isoflurane ($\text{CF}_2\text{HOCHClCF}_3$), sevoflurane ($\text{CH}_2\text{FOC}(\text{CF}_3)_2\text{H}$), enflurane ($\text{CF}_2\text{HOFC}_2\text{FCIH}$), and halothane (CBrClHCF_3). At the present time, the rotational spectra of desflurane^a and sevoflurane have been assigned and analyzed. For sevoflurane the rotational constants are $A = 1025.6$ MHz, $B = 899.5$ MHz and $C = 601.3$ MHz. Analysis of the spectra for the other three species is in progress. Real-time detection limits in air are in the $\mu\text{mol/mol}$ regime which are more than adequate for this application where levels approach $1000 \mu\text{mol/mol}$ in the patient's breath. The ultimate goal is to demonstrate that FTMW spectroscopy is a viable alternative to molecular vibration infrared spectroscopy for performing real-time monitoring of the concentrations of these anesthetics in a patient's breath during surgical procedures.

^aR. D. Suenram, A. R. Hight Walker, and F. J. Lovas, Talk MF04, 51st International Symposium on Molecular Spectroscopy, 1996.