OBSERVATION OF THE $\tilde{A} - \tilde{X}$ ELECTRONIC TRANSITION OF BUTYL PEROXY RADICALS USING CAVITY RINGDOWN SPECTROSCOPY.

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An important reaction involving the low temperature oxidation of hydrocarbons concerns the production of alkyl peroxy radicals (RO_2). These species of highly reactive molecules are present in atmospheric reactions, as well as internal combustion engines. Longer carbon chain alkyl peroxy radicals, i.e. butyl peroxy radical, are especially important in combustion processes because of their ability to rapidly isomerize thereby opening new branching and propagation channels in the chain reaction. Therefore, it is useful to develop a database of information concerning alkyl peroxy radicals with multiple carbon atoms. In the case of butyl peroxy radical, most experiments[ab] have focused only on *t*-butyl peroxy radical, neglecting the other isomers.

Cavity ringdown spectroscopy (CRDS) has been applied to study the near-IR electronic transition of the isomers of the butyl peroxy radical. The four isomers of the butyl peroxy radical are *n*-butyl, *sec*-butyl, isobutyl, and *t*-butyl peroxy radical. We report on the cavity ringdown spectra of the $\widetilde{A} - \widetilde{X}$ electronic transition of *n*-butyl, *sec*-butyl, isobutyl, and *t*-butyl peroxy radicals. The bands that have been observed are the origin and oxygen-oxygen stretch for each isomer. Also, transitions from several different conformers have been detected.

[a] T. J. Wallington, P. Dagaut, and M. J. Kurylo, Chem. Rev. **92**, 667(1992)

[b] E. P. Clifford, P. G. Wenthold, R. Gareyev, W. C. Lineberger, C. H. DePuy, V. M. Bierbaum, and G. B. Ellison, J. Chem. Phys. **109**, 10293 (1998)