HYDROCARBONATED RADICALS WITH A C=C CORE

HIDETO KANAMORI, *Department of Applied Physics, Tokyo Institute of Technology, Tokyo, Japan 152*.

A series of hydrocarbonated radicals with a C=C core and unpaired electrons have been studied by high-resolution diode laser kinetic spectroscopy. Those molecules are ^2C_2H, $^3C_2H_2$ and $^2C_2H_3$, which are represented as (C=C)H_n [n=1 to 3]. Each molecule has shown unique characteristic features.

C_2H ($X^2\Sigma$) has abnormally low bending mode vibration of which frequency is a half of typical linear molecules.

C_2H_2 ($\tilde{a}^3B_2$) is *cis*-bent, however, *trans*-isomer is believed to locate energetically close to it.

C_2H_3 ($\tilde{X}^2A_1$) is planer and has a resonant structure in which α-proton moves through the potential barrier between two identical local minima by tunneling.

After an overview of these radicals this talk will focus on the recent results of the triplet acetylene including the isotope dependence among C_2H_2, C_2HD and C_2D_2. We will discuss the dynamics of internal conversion and isomerization based on the precise molecular constants determined by high resolution spectroscopy and the natural lifetimes determined by kinetic spectroscopy.

Finally, it will be reviewed the common characteristic features of these (C=C)H_n radicals as a family.