THERMAL DECOMPOSITION MECHANISM OF BUTYRALDEHYDE

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The thermal decomposition of butyraldehyde, $CH_3CH_2CH_2C(O)H$, has been studied in a resistively heated SiC tubular reactor. Products of pyrolysis were identified via matrix-isolation FTIR spectroscopy and photoionization mass spectrometry in separate experiments. Carbon monoxide, ethene, acetylene, water and ethylketene were among the products detected. To unravel the mechanism of decomposition, pyrolysis of a partially deuterated sample of butyraldehyde was studied. Also, the concentration of butyraldehyde in the carrier gas was varied in experiments to determine the presence of bimolecular reactions. The results of these experiments can be compared to the dissociation pathways observed in similar aldehydes and are relevant to the processing of biomass, foods, and tobacco.