

MOLECULAR STRUCTURE AND REACTIVITY IN THE PYROLYSIS OF ALDEHYDES

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The effect of alkyl chain structure on pyrolysis mechanisms has been investigated in a series of aldehydes. Isovaleraldehyde, $\text{CH}_3\text{CH}(\text{CH}_3)\text{CH}_2\text{CHO}$, and pivaldehyde, $(\text{CH}_3)_3\text{CCHO}$, were subject to thermal decomposition in a resistively heated SiC tubular reactor at 800 – 1200°C. Matrix-isolation FTIR spectroscopy was used to identify pyrolysis products. Carbon monoxide and isobutene were major products from each of the aldehydes, which is consistent with what is known from previous studies of unbranched alkyl-chain aldehydes. Other products observed include vinyl alcohol, propene, acetylene, and ethylene, revealing complexities to be considered in the pyrolysis of large, branched-chain aldehydes.