PYROLYSIS AND MATRIX-ISOLATION FTIR OF ACETOIN

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Acetoin, $CH_3C(O)CH(OH)CH_3$, is an additive used in foods and cigarettes as well as a common component of biomass pyrolysate during the production of biofuels, yet little is known about its thermal decomposition mechanism. In order to identify thermal decomposition products of acetoin, a gas-phase mixture of approximately 0.3% acetoin in argon was subject to pyrolysis in a resistively heated SiC microtubular reactor at 1100-1500 K. Matrix-isolation FTIR spectroscopy was used to identify pyrolysis products. Many products were observed in analysis of the spectra, including acetylene, propyne, ethylene, and vinyl alcohol. These results provide clues to the overall mechanism of thermal decomposition and are important for predicting emissions from many industrial and residential processes.