

## THERMAL DECOMPOSITION OF ACETALDEHYDE STUDIED BY MATRIX IR AND PIMS SPECTROSCOPY

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In all previous experimental studies of the thermal decomposition of acetaldehyde ( $\text{CH}_3\text{CHO}$ ), the products were presumed to be  $\text{CH}_3 + \text{CHO}$ . These species result from cracking of the weakest bond. Other routes are possible:  $\text{DH}_{298}(\text{CH}_3-\text{CHO}) = 84.8 \pm 0.2 \text{ kcal mol}^{-1}$ ;  $\text{DH}_{298}(\text{CH}_3\text{CO}-\text{H}) = 89.4 \pm 0.3 \text{ kcal mol}^{-1}$ ;  $\text{DH}_{298}(\text{H}-\text{CH}_2\text{CHO}) = 92 \pm 2 \text{ kcal mol}^{-1}$ . This work explores the possibility of other thermal decomposition pathways, that result via C-H bond scission. We have used a resistively heated SiC tubular reactor with a  $65 \mu\text{sec}$  residence time to study the thermal cracking of acetaldehyde. The decomposition products are identified by two independent techniques: 118.2 nm (10.487 eV) VUV photoionization mass spectroscopy and infrared absorption spectroscopy in a cryogenic matrix. The observed dissociation channels seem to be:

