

Kinetic studies of the oxidation of a series of aldehydes in a jet-stirred reactor. Experiments and modeling.

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There is a strong drive towards utilizing oxygenated biofuels, such as alcohols, in blends with conventional fossil fuels. Improving the kinetic modeling of the oxidation of these bio-derived alcohols requires further investigation of their key stable intermediates such as the aldehydes. In this study, an experimental and chemical kinetic modeling investigation of several aldehydes oxidation was carried out. Experiments were conducted in a jet stirred reactor over a wide range of equivalence ratios (0.5-2), temperatures (530-1200 K), and pressure (1-10 atm). Stable species concentration profiles were measured in the jet stirred reactor. A detailed chemical kinetic reaction model was validated using the present experimental results and existing literature data. The model was used also to provide insight into the controlling reaction pathways for aldehydes oxidation.