



Simulation Chamber Studies on the NO₃ Chemistry of Atmospheric Aldehydes

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Absolute reaction rate studies of the NO₃ radical with 4 aldehydes of atmospheric relevance were performed in the atmosphere simulation chamber SAPHIR at the Research Center Jülich. The rate coefficients (ethanal: 2.6±0.5, propanal: 5.8±1.0, butanal: 11.9±1.4, benzaldehyde: 2.2±0.6; all in 10⁻¹⁵ cm³ s⁻¹ at 300 K) were determined from measured concentration–time profiles of aldehydes and NO₃ at near ambient concentrations. The values for the aliphatic aldehydes are in good agreement with the most recent IUPAC recommendations. Furthermore, the measured concentration–time profiles of product aldehydes (in the propanal and butanal experiments) were compared to model calculations based on the MCM v3. The product yields were found to differ significantly from the model prediction.