



## Atmospheric chemistry of C3-C6 cycloalkanecarbaldehydes

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The rate coefficients for the gas phase reaction of NO<sub>3</sub> and OH radicals with a series of cycloalkanecarbaldehydes have been measured in purified air at 298 ± 2 K and 760 ± 10 Torr by the relative rate method using a static reactor equipped with long-path FT-IR detection. The values obtained for the OH radical reactions (in units of 10<sup>-11</sup> cm<sup>3</sup> molecules<sup>-1</sup>s<sup>-1</sup>) were: cyclopropanecarbaldehyde, 2.13 ± 0.05; cyclobutanecarbaldehyde, 2.66 ± 0.06; cyclopentanecarbaldehyde, 3.27 ± 0.07; cyclohexanecarbaldehyde, 3.75 ± 0.05. The values obtained for the NO<sub>3</sub> radical reactions, (in units of 10<sup>-14</sup> cm<sup>3</sup> molecules<sup>-1</sup>s<sup>-1</sup>) were: cyclopropanecarbaldehyde, 0.61 ± 0.04; cyclobutanecarbaldehyde, 1.99 ± 0.06, cyclopentanecarbaldehyde 2.55 ± 0.10; cyclohexanecarbaldehyde, 3.19 ± 0.12. Furthermore, the reaction products with OH were investigated using long-path FT-IR spectroscopy and proton-transfer-reaction mass spectrometry (PTR-MS). The identified products cover a wide spectrum of compounds including nitroperoxycarbonyl cycloalkanes, cycloketones, cycloalkyl nitrates, multi-functional compounds containing carbonyl, hydroxy and nitrooxy functional groups, HCOOH, HCHO, CO and CO<sub>2</sub>.