

## Oxidation processes of light alkenes in the atmosphere

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Organic compounds are important trace constituents in the troposphere that originate from many different natural and man-made sources since atmospheric reactions of organic compounds influence other trace constituents. In the urban atmosphere, alkenes (and alkynes) have a smaller contribution to total NMHCs relative to alkanes and aromatics, but have a comparable contribution to OH reactivity and MIR (maximum incremental reactivity) reactivity (that is potential to form ozone under conditions where availability of NO<sub>x</sub> does not limit ozone formation). In general, it is important to understand the atmospheric chemistry of lighter alkenes and alkynes such as ethene (C<sub>2</sub>H<sub>4</sub>), propene (C<sub>3</sub>H<sub>6</sub>), and ethyne (C<sub>2</sub>H<sub>2</sub>), since they have the largest anthropogenic emissions.

In this study, the pressure-dependent reactions of Cl atoms with C<sub>2</sub>H<sub>4</sub>, C<sub>3</sub>H<sub>6</sub>, and C<sub>2</sub>H<sub>2</sub> have been examined. We have carried out absolute rate measurements of these rate constants using pulsed laser photolysis / vacuum ultraviolet laser-induced fluorescence (PLP/VUV-LIF) techniques over the pressure range of 1-20 Torr (5-20 Torr for C<sub>2</sub>H<sub>2</sub>) in N<sub>2</sub> diluent at room temperature. In this presentation, the pressure dependence of the rate constants obtained in this study will be compared with data available in the literature obtained by relative rate methods using FTIR and GC. Mechanisms of these reactions and their atmospheric implications will also be discussed.