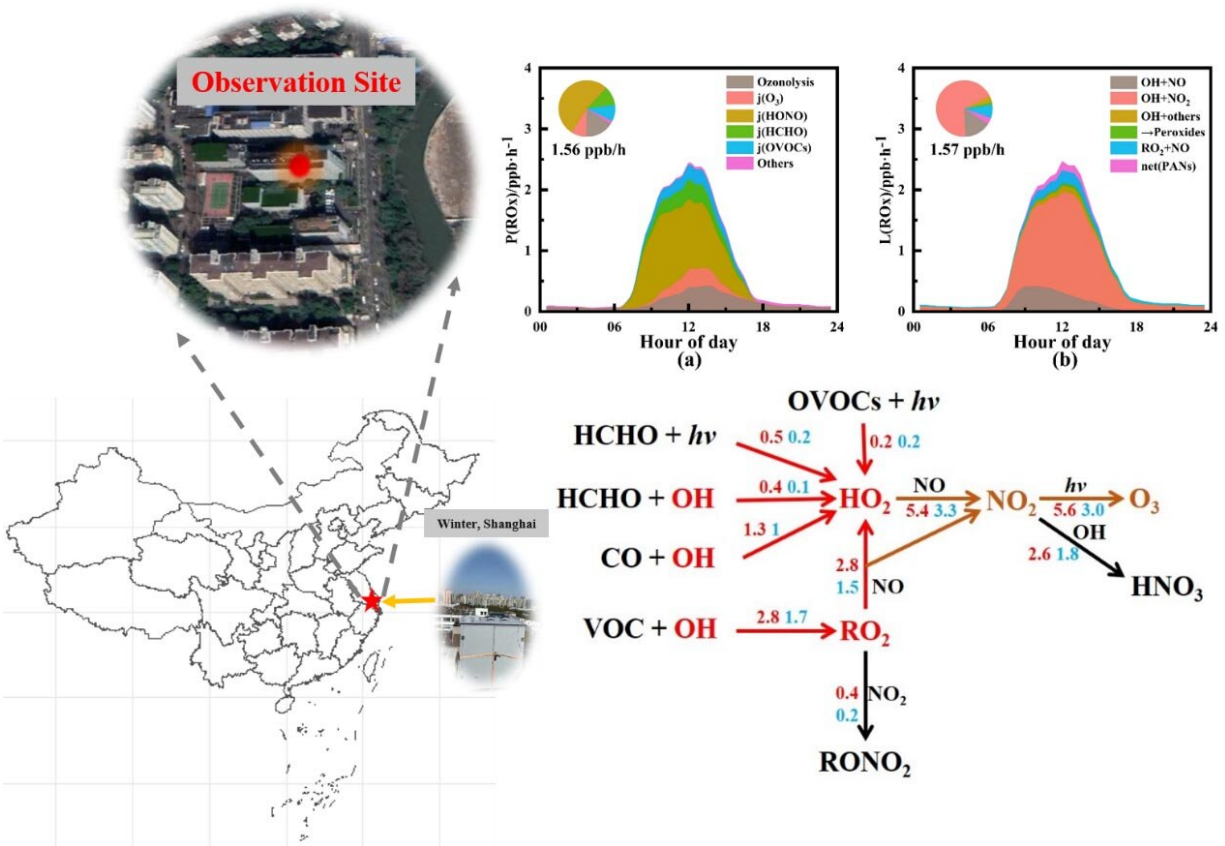


Underestimated ozone production in cities: Higher HOx observed with self-developed instrument

January 28 2022, by Zhang Nannan



Level of HOx radicals was higher than previous wintertime observations. Credit: Hu Renzhi

The local ozone generation was greatly underestimated with current mechanism under high NO_x conditions, according to a recent study conducted by researchers led by Prof. Xie Pinhua from the Hefei Institutes of Physical Science (HFIPS) of the Chinese Academy of Sciences (CAS).

This research, based on the observed concentration of HO_x [free radicals](#), has pointed a way toward future ozone pollution control. Related results were published on *Science of the Total Environment*.

Radicals are essential driving force of secondary pollution formation. Scientists have observed high concentrations of OH radicals in [urban areas](#) and established unconventional regeneration mechanisms. Severe underestimation of [ozone](#) formation is not accidental, due to regional variations in atmospheric oxidation and the shortcomings of existing box model mechanisms. So it is necessary to study atmospheric oxidation in different environments.

In view of this, following a one-month first in-situ HO_x radicals measurement in the wintertime of Shanghai with a self-developed HO_x instrument, Prof. Hu Renzhi and Ph.D. student Zhang Guoxian, a member of the team, conducted a closure analysis on megacity atmospheric chemical processes with a new box model. The level of HO_x radicals they observed was higher than previous wintertime observations (OH: $2.7 \times 10^6 \text{ cm}^{-3}$, HO₂: $0.8 \times 10^8 \text{ cm}^{-3}$).

Considering the overview of [radical](#) concentrations, reactivities and budget channels, they concluded that the complex carbonyls-related oxidation under elevated photochemistry was a possible factor for the discrepancy of the radical sources.

More information: Guoxian Zhang et al, Observation and simulation of HO_x radicals in an urban area in Shanghai, China, *Science of The*

Total Environment (2021). [DOI: 10.1016/j.scitotenv.2021.152275](https://doi.org/10.1016/j.scitotenv.2021.152275)

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