6.059 Aromatic VOC effects on OH and Ozone at global scale.

Early Career Scientist

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Abstract:

Volatile Organic Compounds (VOC) are partially responsible of the formation and removal of atmospheric key species as ozone and hydroxyl radical (OH). Among VOCs, aromatics compounds concentrations make up for a large VOC fraction in urban and peri-urban areas (up to 60%). Aromatic sources are mainly related to fossil fuel use and biomass burning, and they are removed primarily by reaction with OH and secondarily by dry
deposition. The lifetimes range from hours to days, hence they may be transported to areas far from sources
and influence air quality there.
The effect that aromatic have on ozone and OH formation/destruction is poorly understood.
This work assesses the atmospheric impacts of the most commonly emitted aromatic VOCs on OH and ozone
at global scale, with the help of an atmospheric chemistry general circulation model.
Specifically, the percentage of ozone produced/removed due to aromatic oxidation is of great interest
in large urban areas and can be helpful for developing air pollution control strategies.
Furthermore, We disentangle
in which areas OH formation is enhanced or depleted and unravel the mechanism controlling it.
Further targets are the quantification of the fraction of aromatics that leads to CO and second organic aerosol
formation. In order to investigate the sensitivity of ozone and OH to aromatics, two simulations are
performed with the atmospheric chemistry-climate model ECHAM/MESSy (EMAC).
One that includes the presence of aromatics and one without them.