

Secondary organic aerosol enhanced by increasing atmospheric oxidizing capacity in Beijing-Tianjin-Hebei (BTH), China

Objective

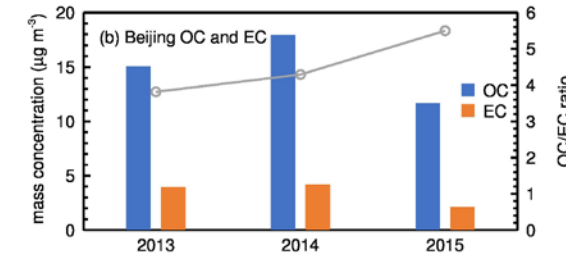
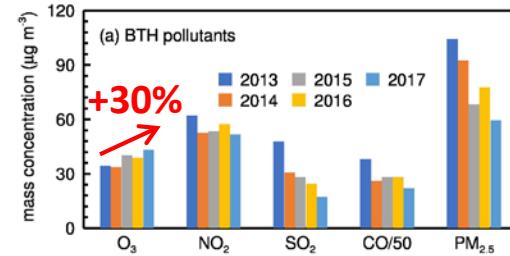
- Examine the impact of increasing oxidizing capacity of the atmosphere on secondary organic aerosol formation

Approach

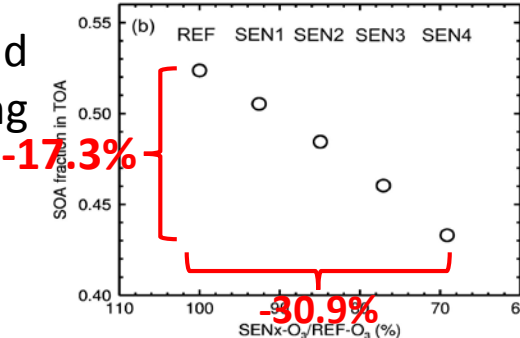
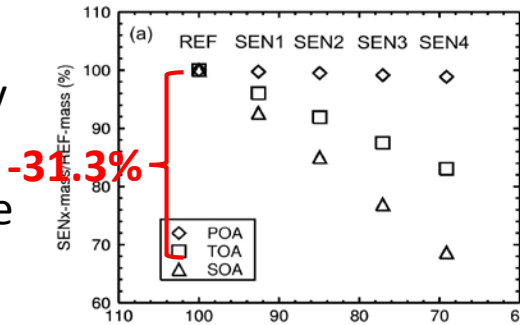
- Perform 4 scenarios of oxidizing capacity reduction (reduce photolysis frequency)
- Analyze the resulting decreases in O_3 and SOA concentrations

Results

- SOA formation in BTH is strongly affected by oxidizing capacity.
- A case characterized by a 30.9% O_3 decrease leads to a SOA reduction of 31.3% and the SOA fraction in TOA decreases by 17.3%.
- Spatially, the impact is ubiquitous in BTH and the largest SOA reduction occurs in Beijing and surrounding areas.
- The main reduction occurs in the pathway involving semi-volatile POA oxidation and partitioning.



Observed increasing O_3 concentration (top) and OC/EC ratio (bottom)



Simulated concurrence of O_3 and SOA decreases (top) and simulated reduction of SOA fraction in TOA (bottom) in 4 sensitivity experiments