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## Chemical reactivity of soot and secondary organic aerosols generated under laboratory conditions

The goal of this experiment is to compare the chemical reactivity of flame soot aerosols and secondary organic aerosol particles (SOA) generated under laboratory conditions. These investigations let us determine the nature and the relative abundance of surface functional groups for each type of particles.
Soot samples are produced in a reproducible way from liquid toluene using a co-flow system [1]. SOA particles are generated from the (photo) oxidation of toluene ($C_7H_8$) or limonene ($C_{10}H_{16}$) in the presence of $O_3$ at 1 atmosphere of air using a (filtered) 150W high-pressure Xe arc lamp. The SOA production is taking place in an atmospheric pressure flow cell whose gas phase is monitored using a differentially pumped quadrupole mass spectrometer. The flow is taken across a PTFE filter during one to two hours at constant throughput leading to typical sample masses of a few mg. The size distribution of both SOA and soot aerosol has been characterized by a Differential Mobility Analyzer (DMA). Particle counts of several $10^5$ particles $cm^{-3}$ were routinely achieved. Finally, chemical reactivity has been investigated in a Knudsen flow reactor using $NO_2$, $O_3$ and $N(CH_3)_3$ as probe molecules.

[1] D. Stadler and M.J. Rossi, Physical Chemistry Chemical Physics 2 (23) 5420-5429 (2000)

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