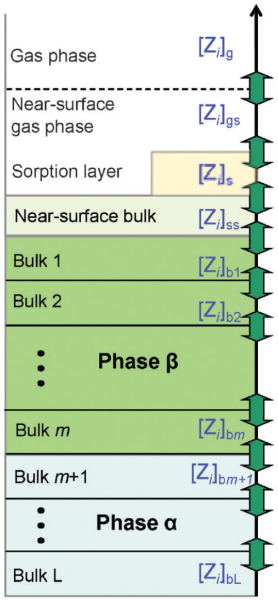
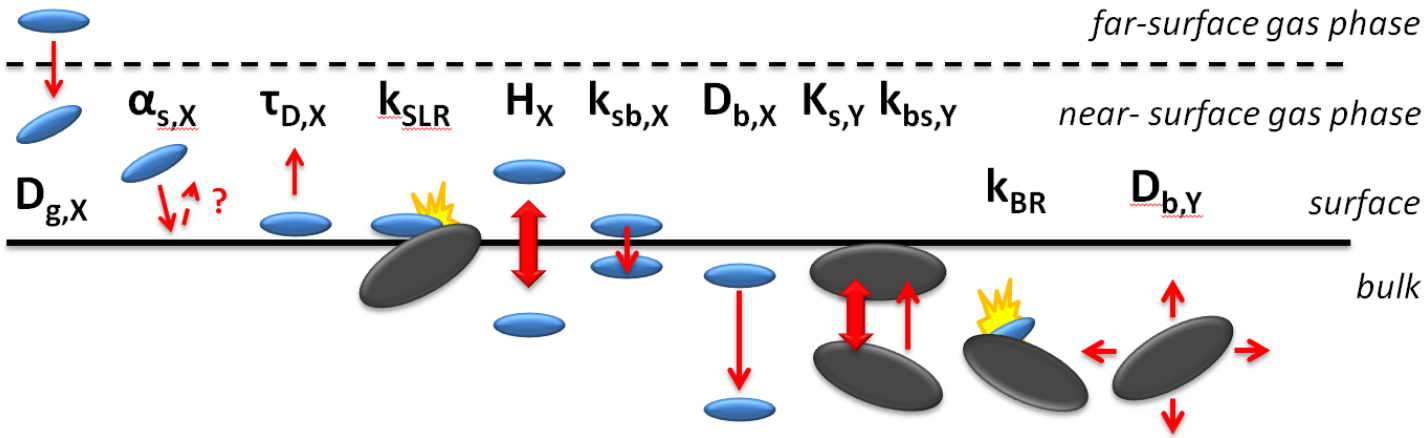
Manabu Shiraiwa (UC Irvine)

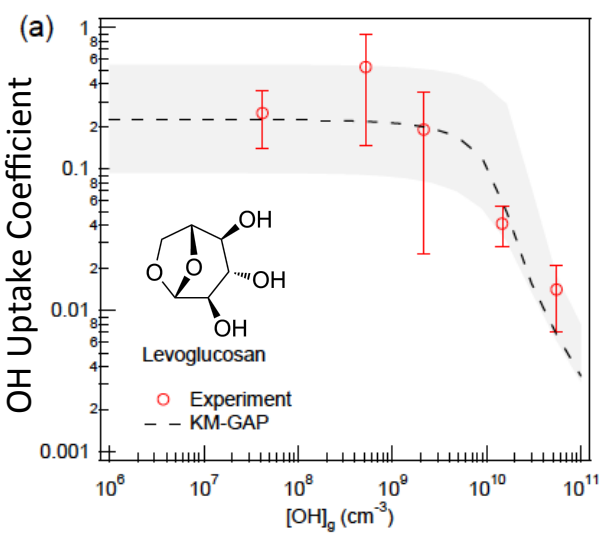
Kinetic Multilayer Model of Gas-Particle Interactions (KM-GAP)



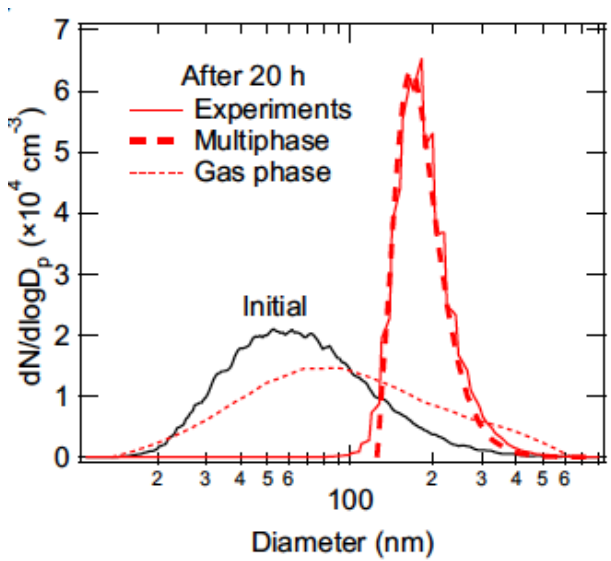
Process model explicitly treating gas diffusion, adsorption/ desorption, bulk diffusion, and chemical reactions



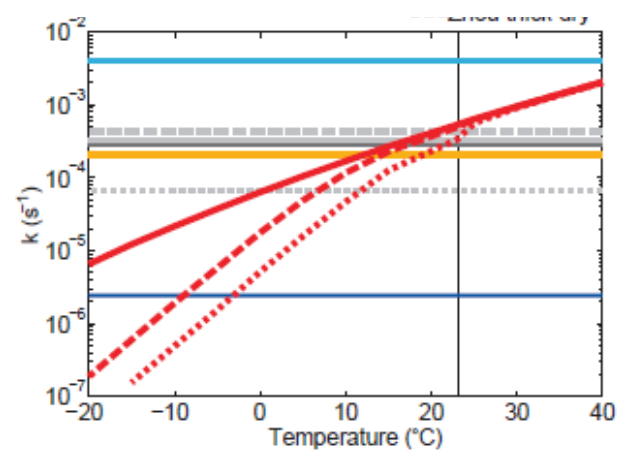
Gas uptake & Chemical Aging



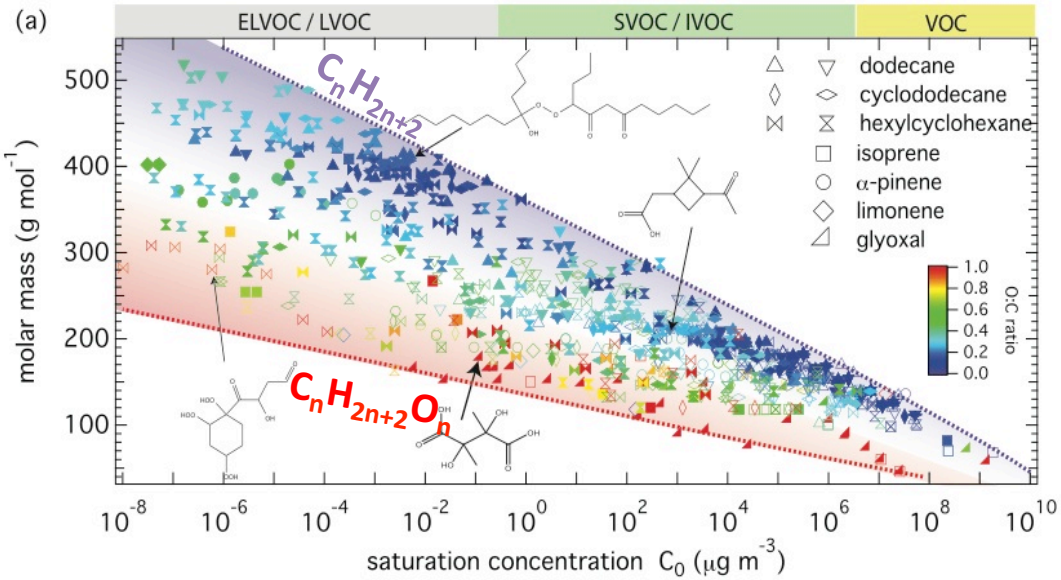
SOA formation & Partitioning



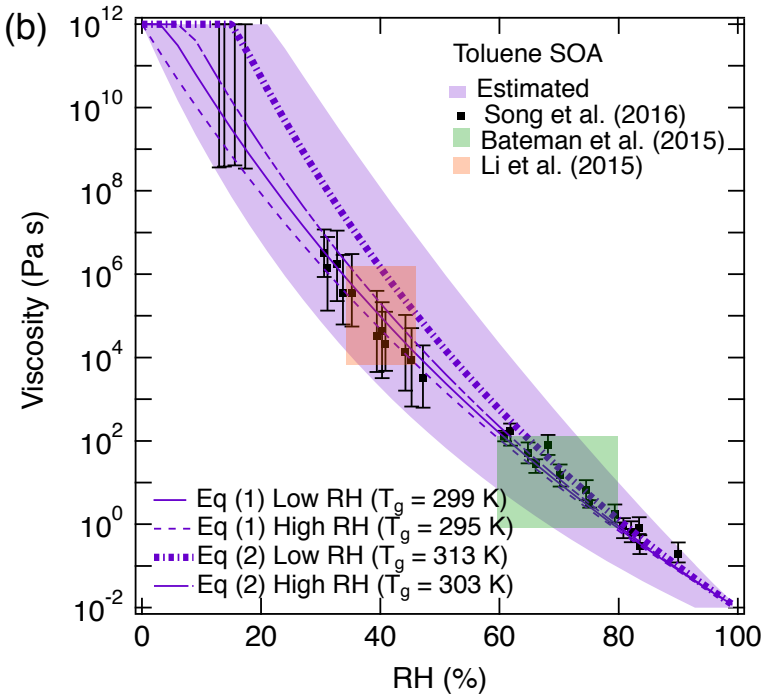
Parameterization for regional/global models

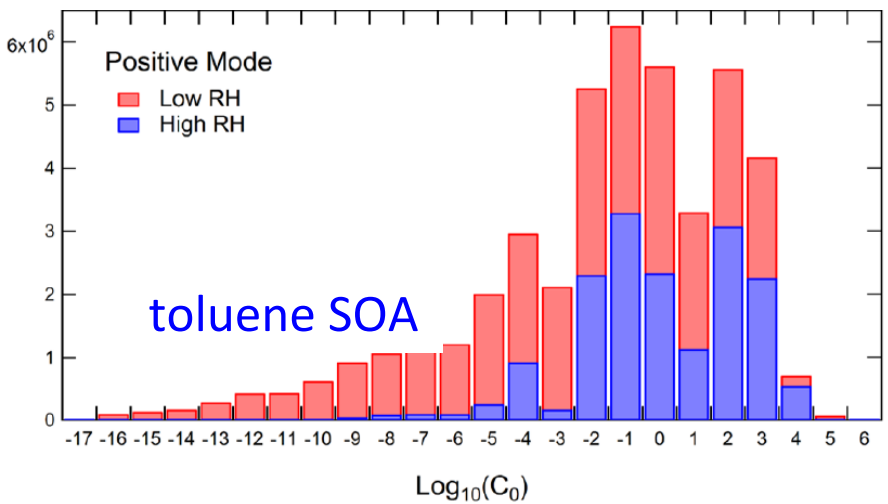


Molecular Corridor Approach: Volatility & Viscosity Estimations



2D framework for description of SOA evolution





$$\log_{10} C_i^{o} = (n_C^0 - n_C^i) b_C - n_O^i b_O - 2\frac{n_C^i n_O^i}{n_C^i + n_O^i} b_{CO} - n_N^i b_N - n_S^i b_S$$

Molecular composition by soft-ionization high resolution MS

Estimation of **volatility and viscosity** of SOA by considering hygroscopicity

Measurements need

- Uptake coefficient, reaction rates
- Molecular composition of organic aerosols (HR-MS, etc.)
- Hygroscopic properties (κ, CCN, HTDMA)
- Phase state (bouncing, viscosity measurements)
- SOA mass, particle size distribution
- Simultaneous measurements of gas and particle phases (FIGAERO, SV-TAG, TDCIMS, etc…)
- Volatility measurements (thermodenuder)