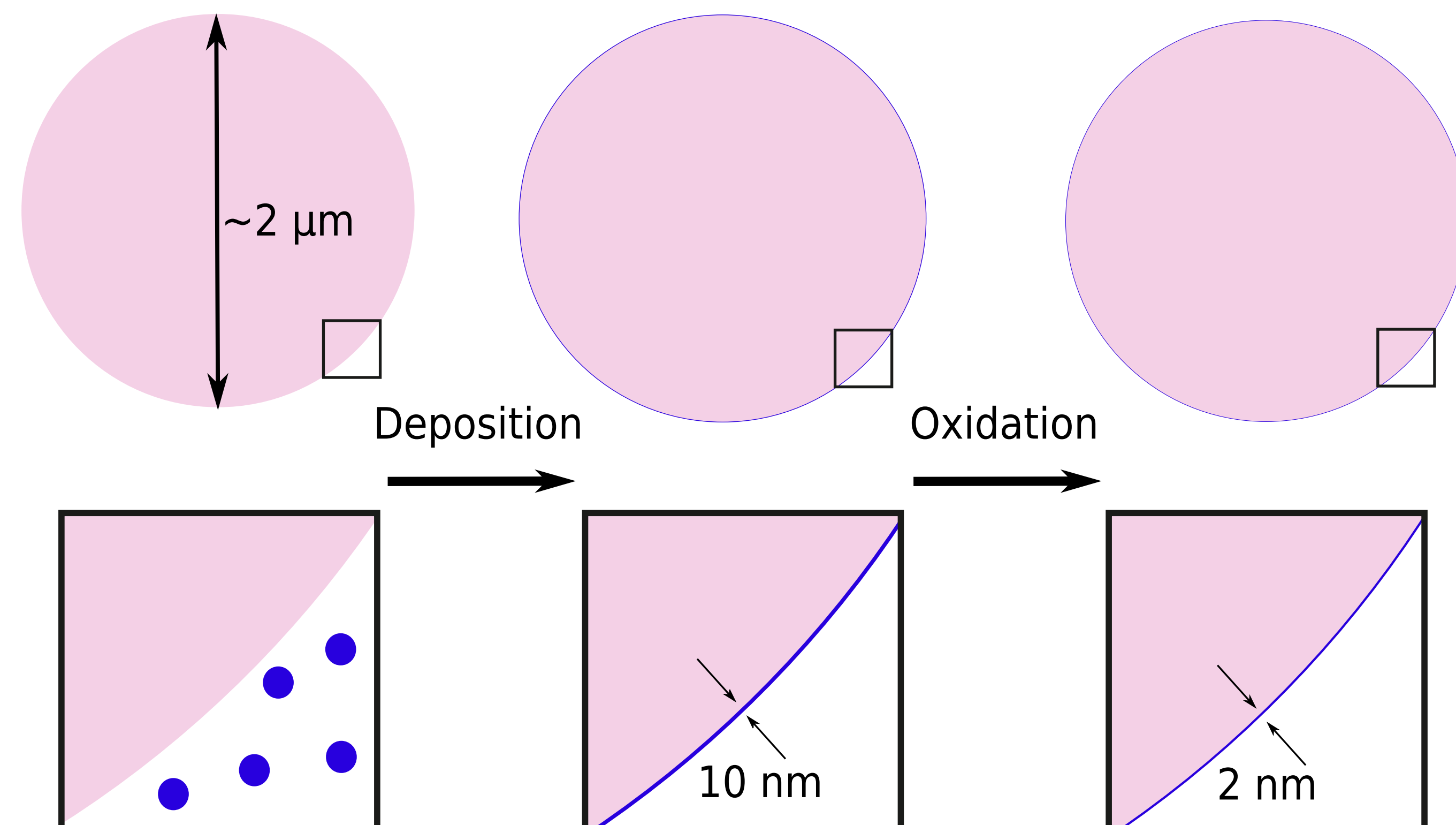
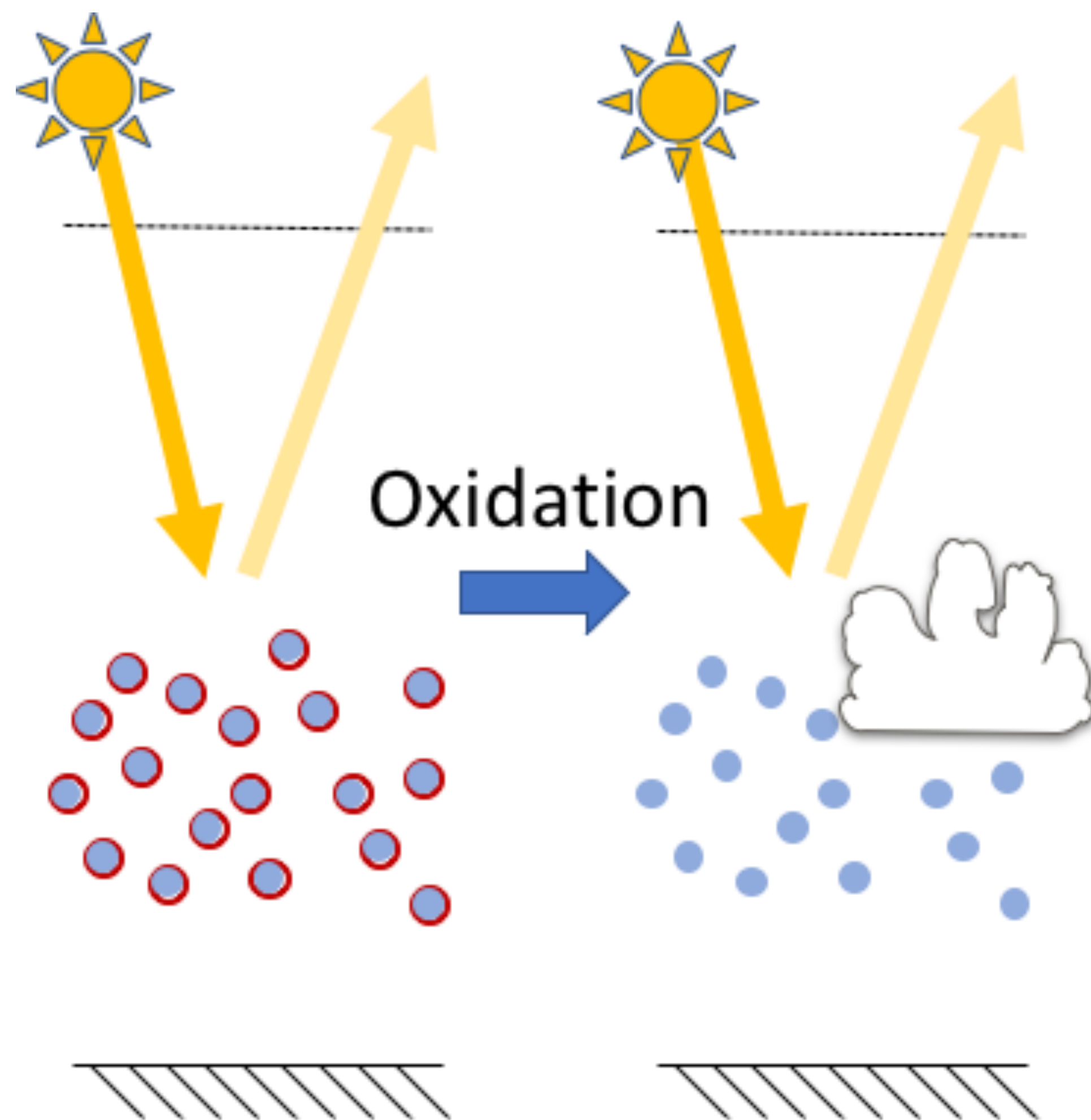


Quantifying the light scattering and atmospheric oxidation rate of real organic films on atmospheric aerosol

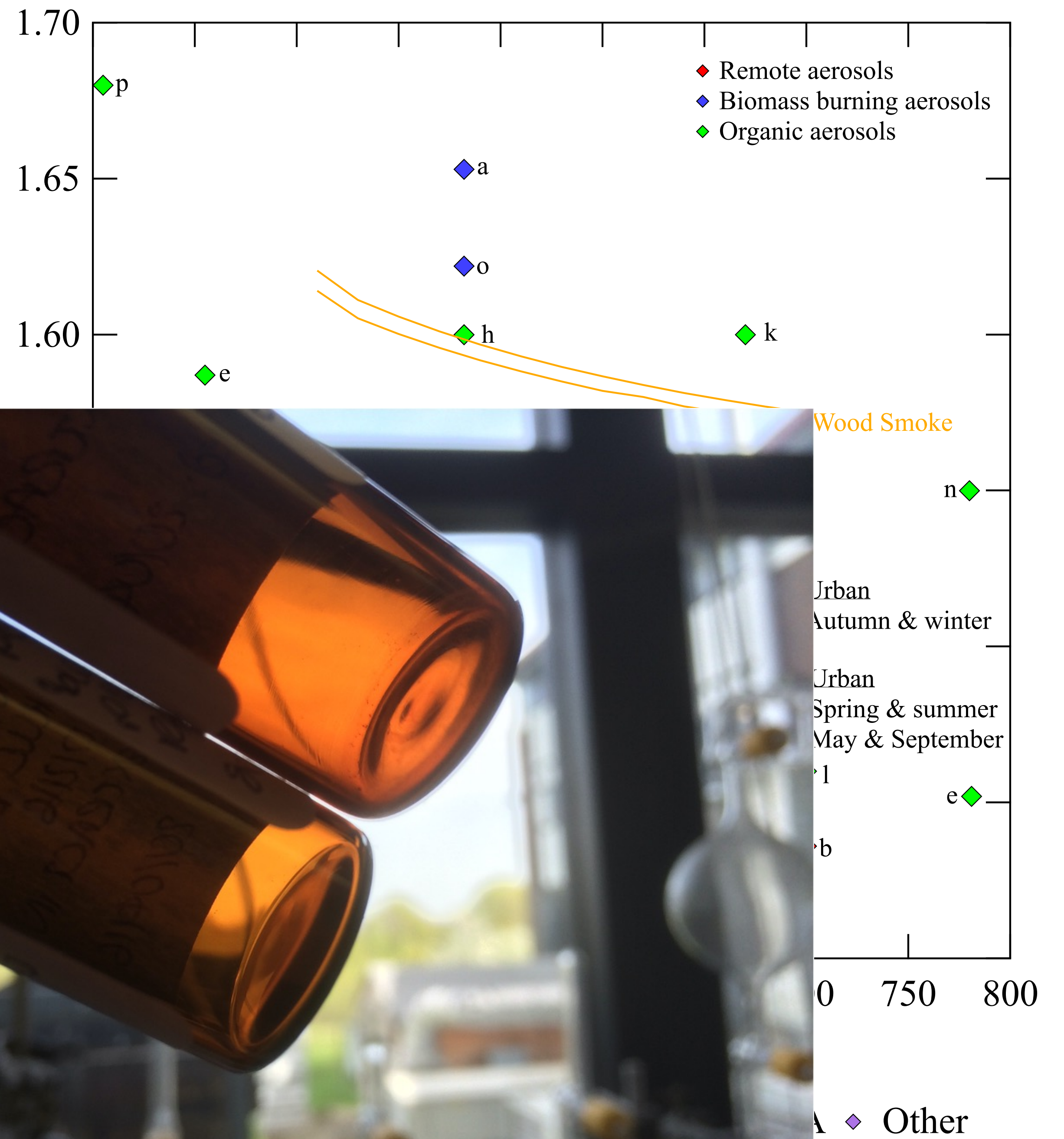
Martin King (Royal Holloway University of London) and Becky Welbourn (ORNL, USA)

What is our aim?



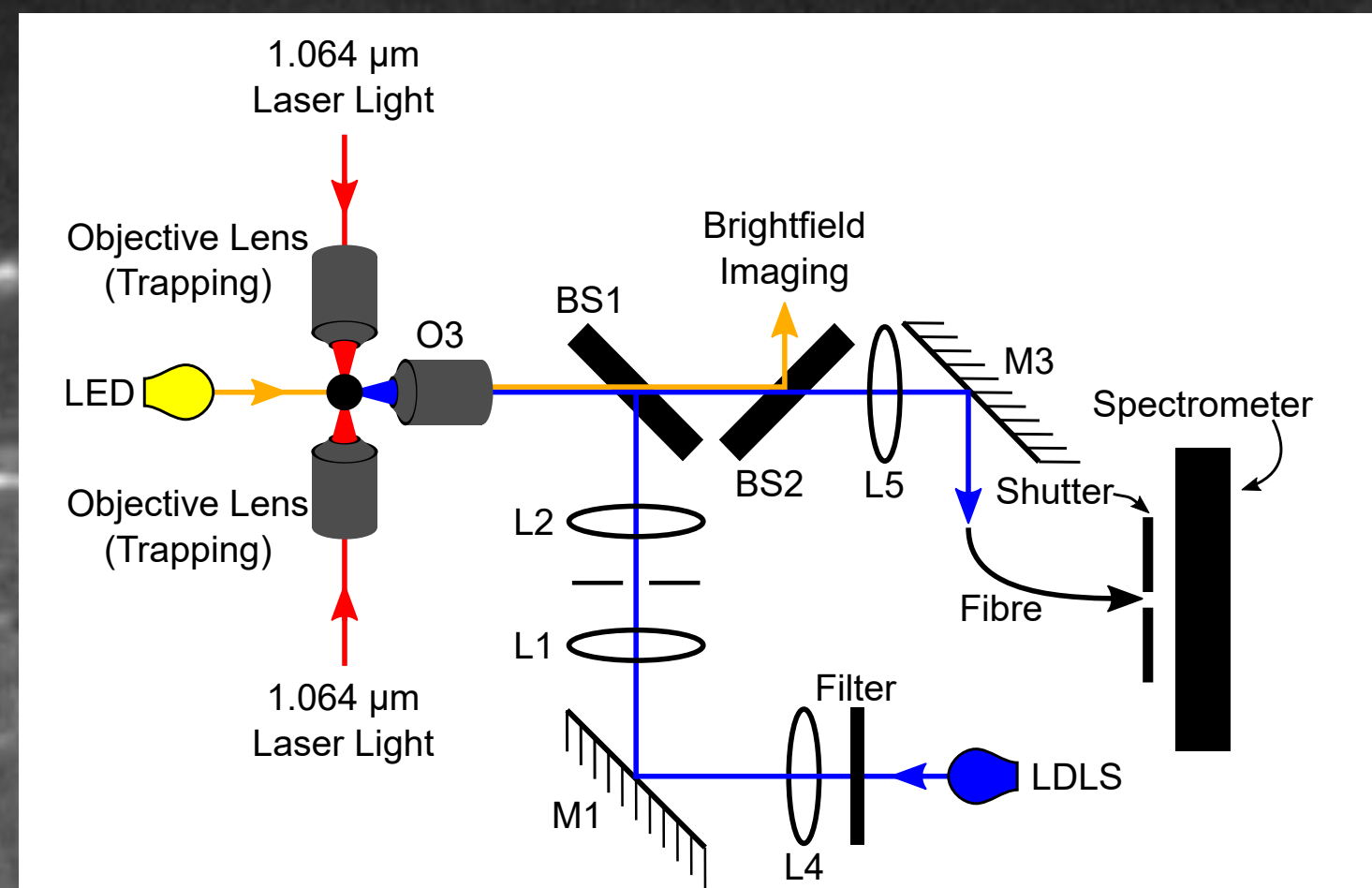
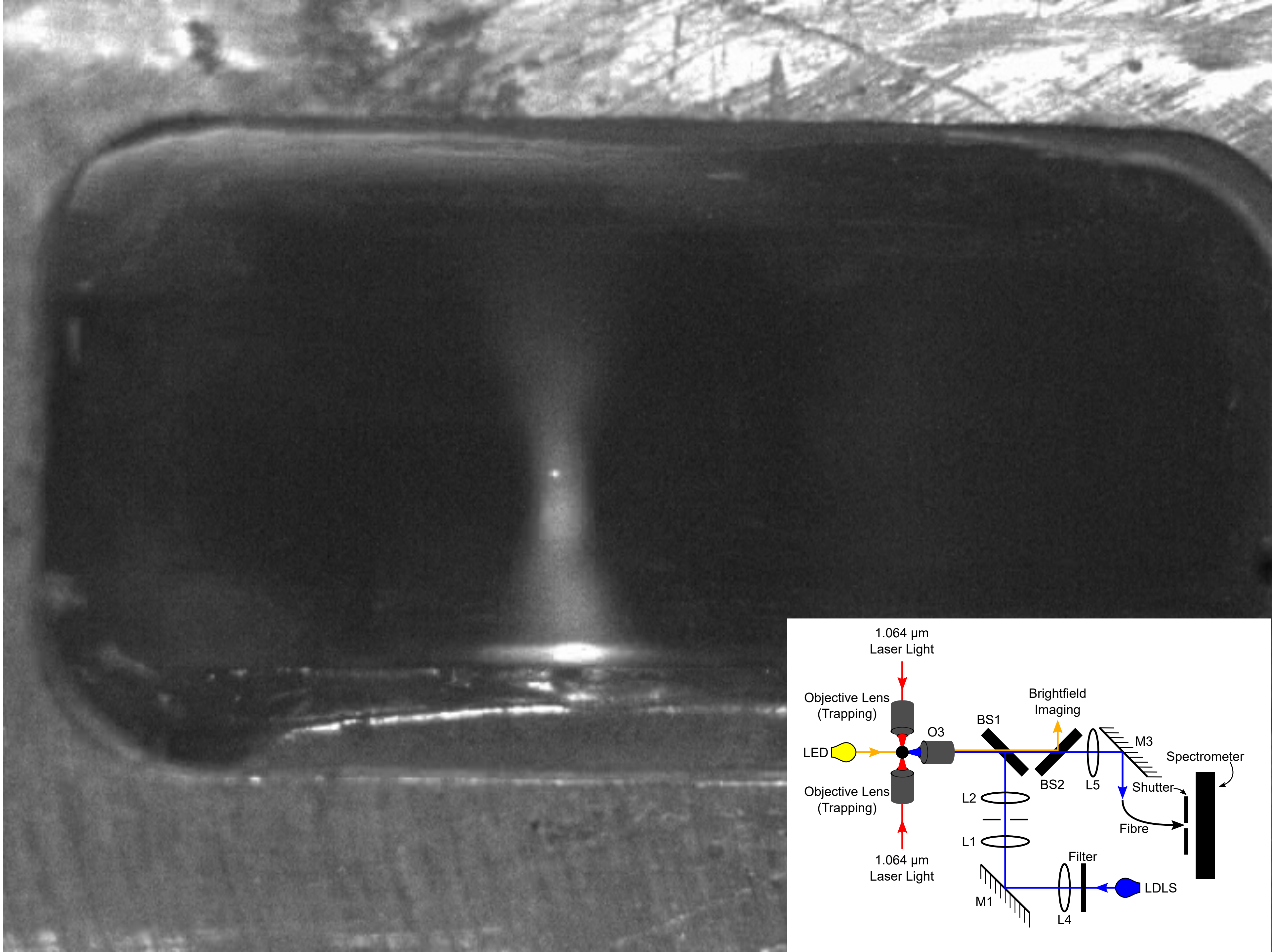


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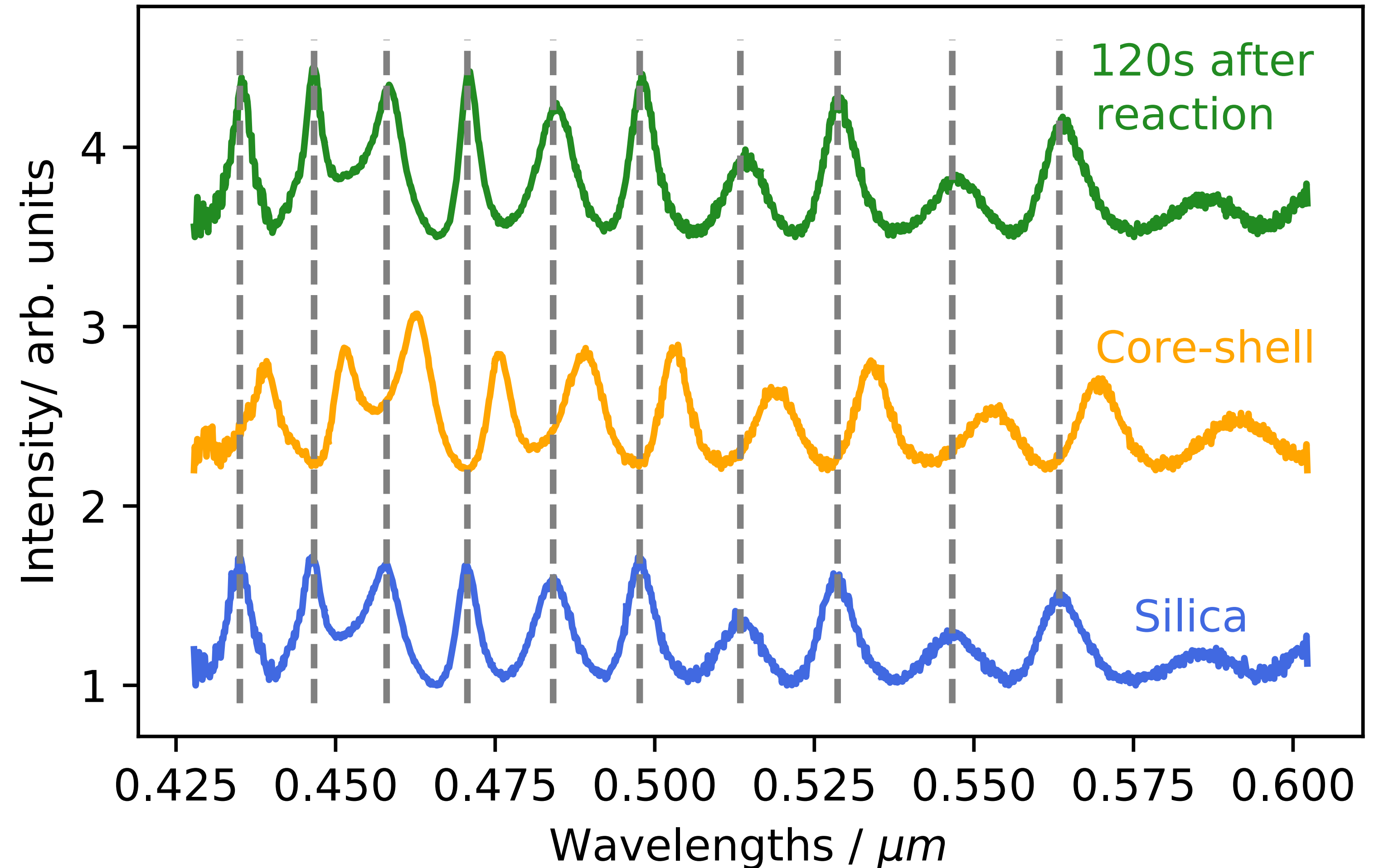
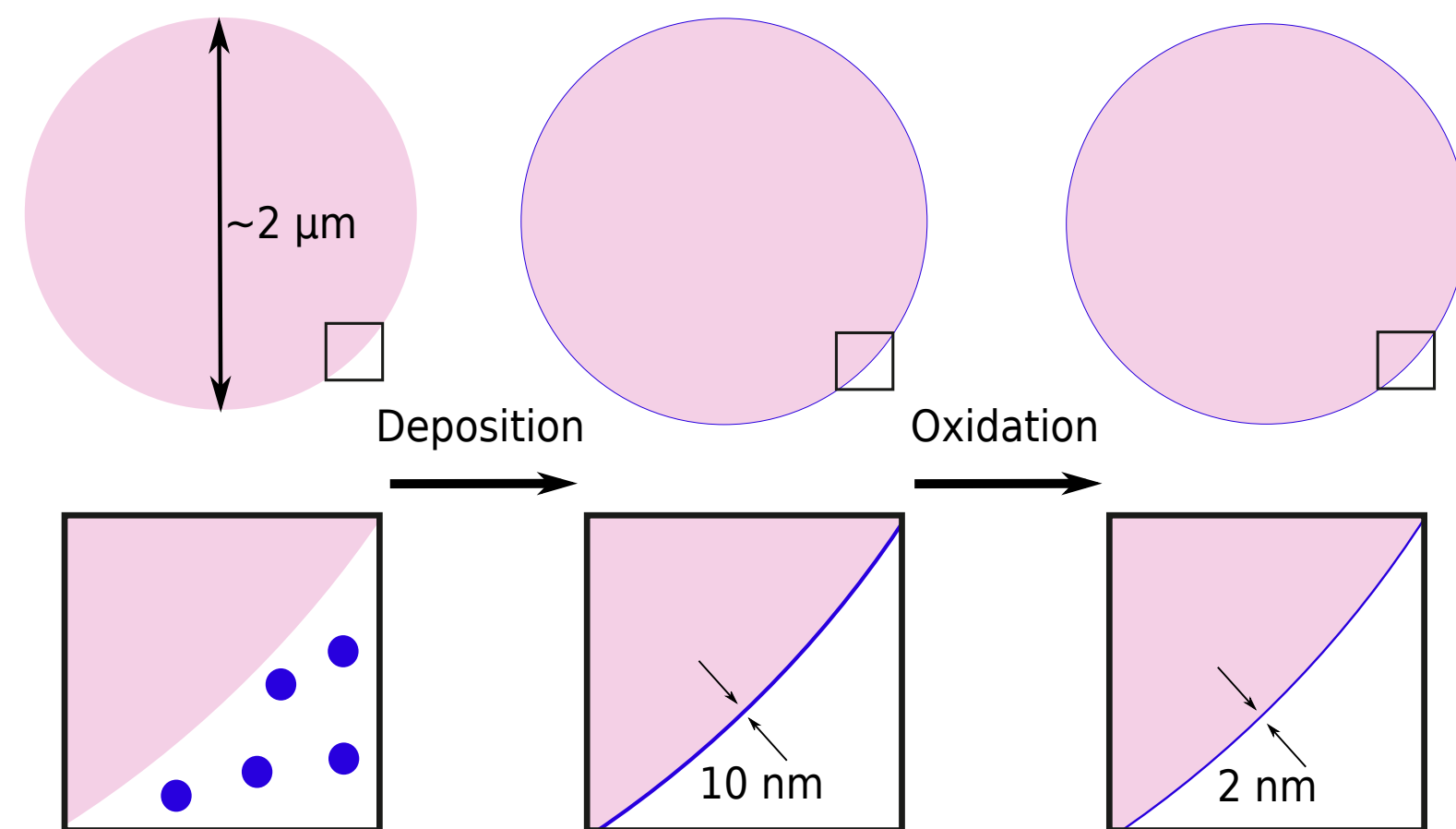


Do these films effect the climate?

Laser Tweezers

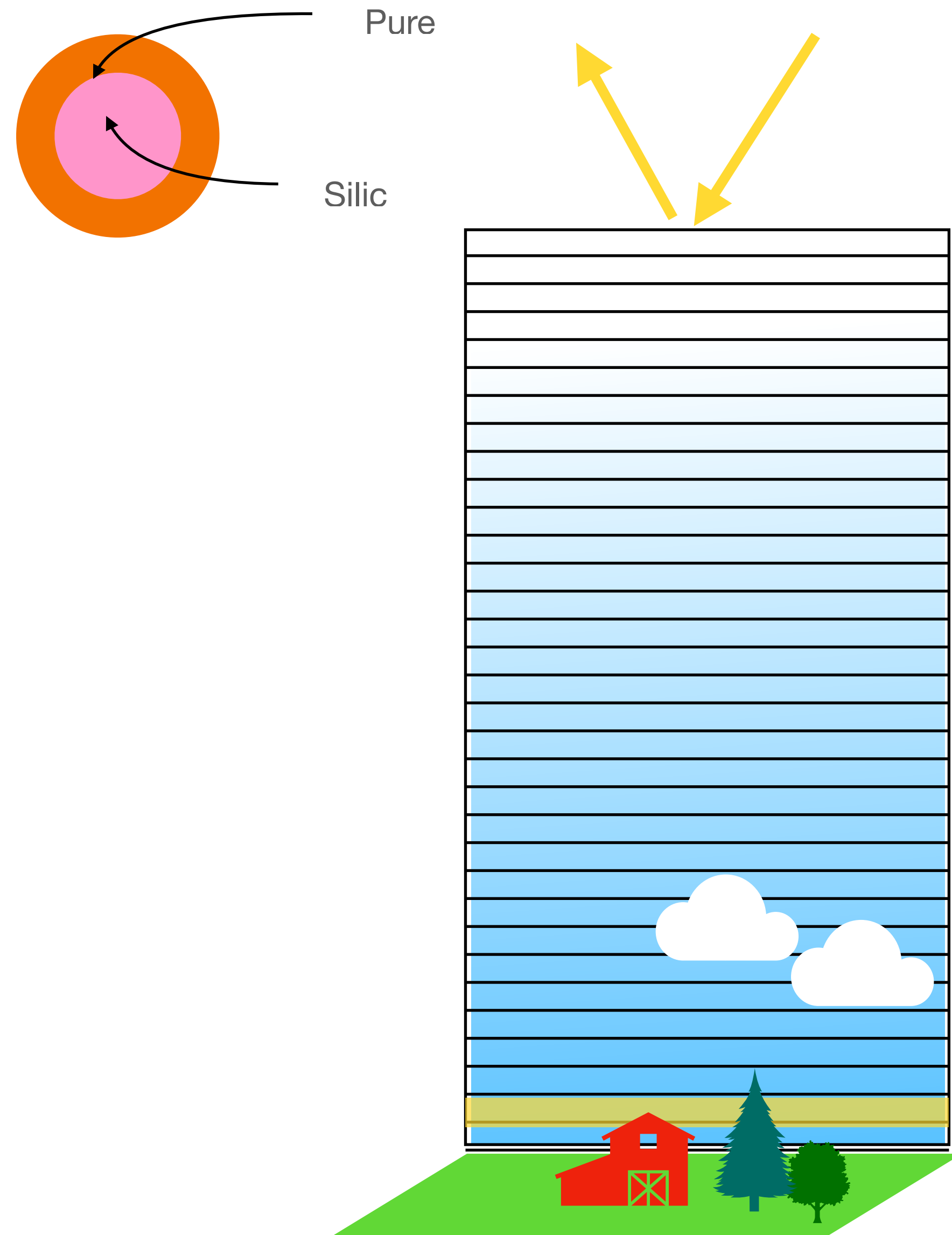
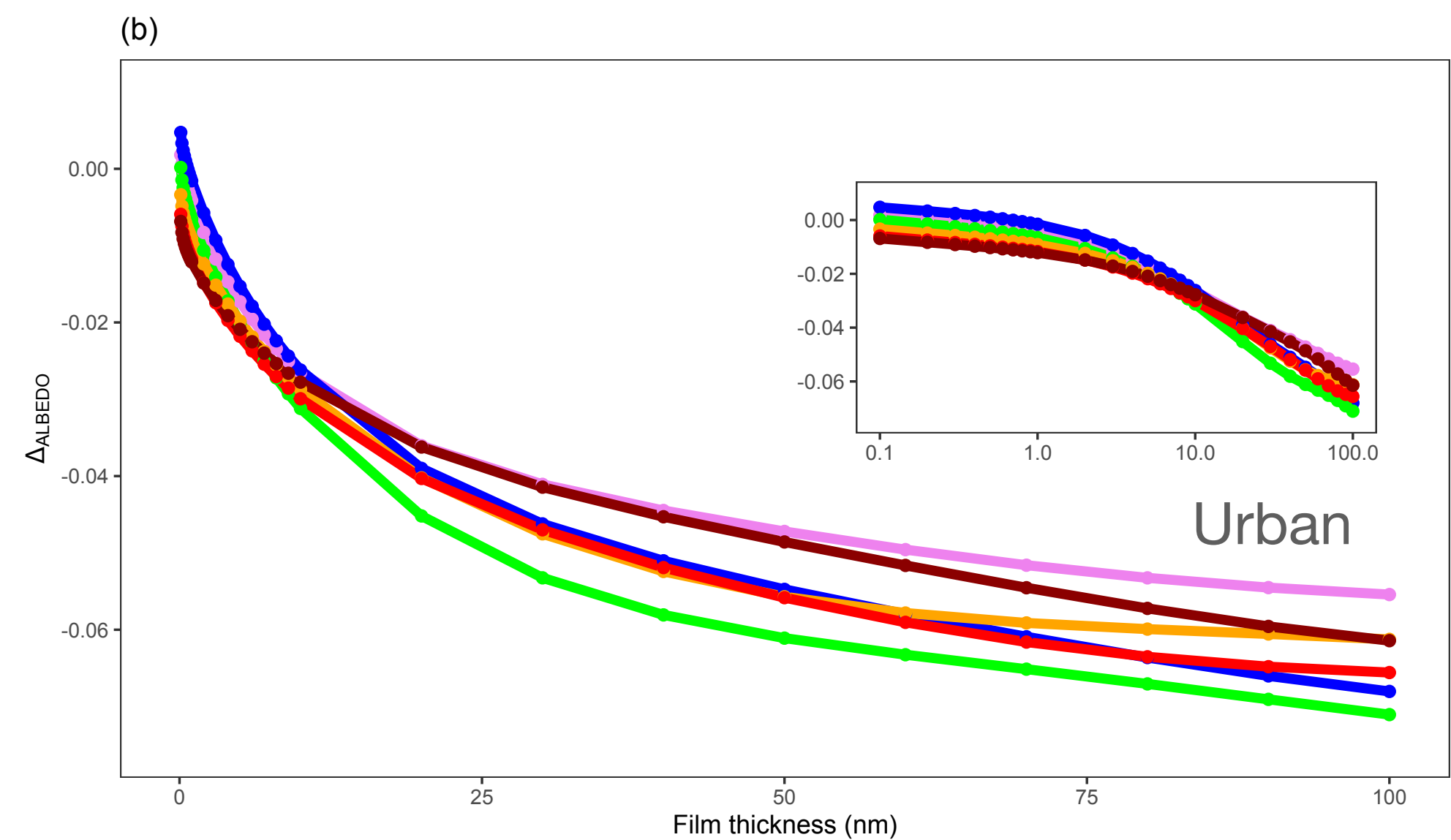
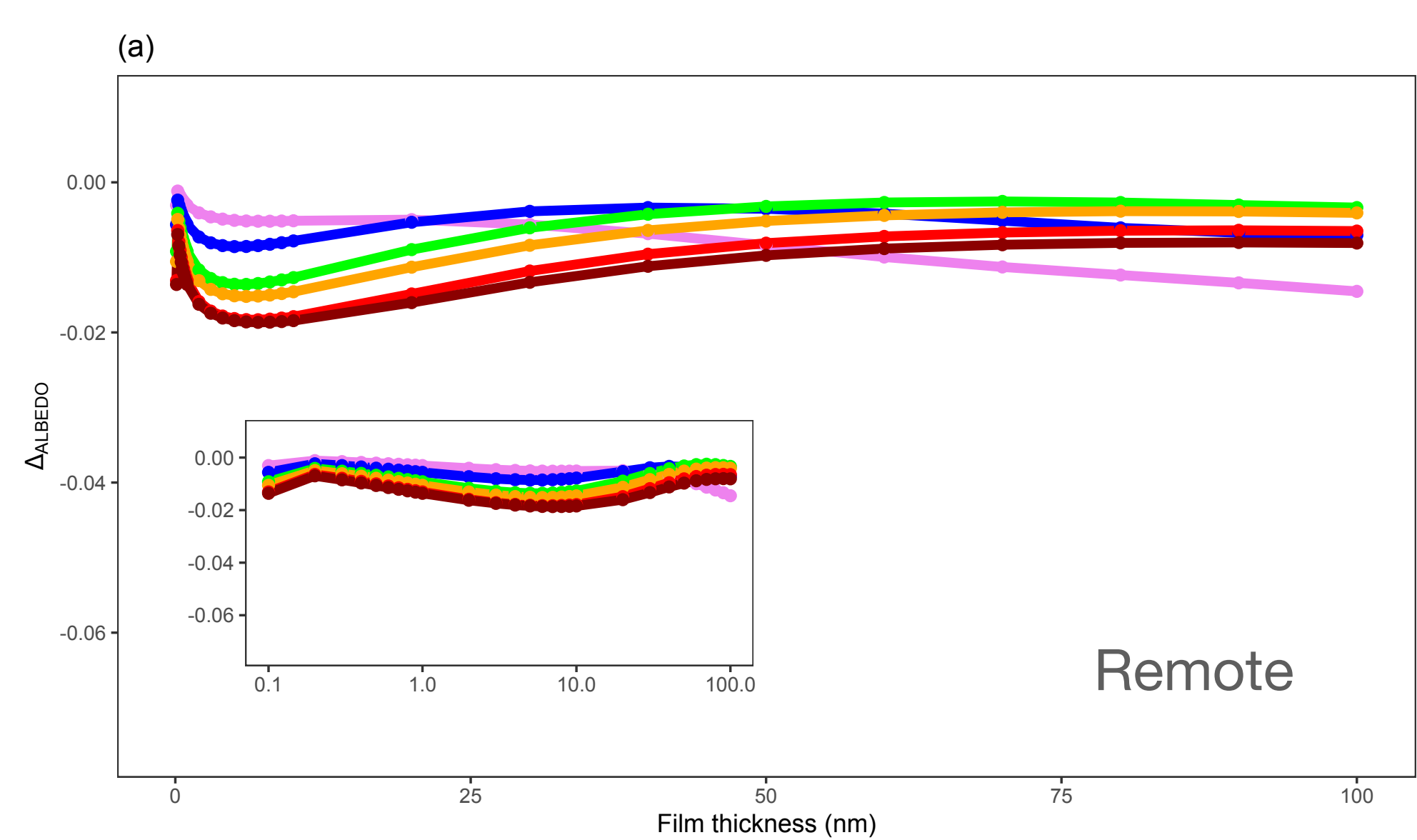


Does it oxidise?



Mie spectra of silica core (blue), silica/urban aerosol core-shell particle 1 before reaction (gold) and 120s after reaction (green), demonstrating that a thin film of 10nm was formed and removed, leaving the silica core only. The grey dashed vertical lines are to demonstrate the bare silica and the oxidised core-shell particle have the same Mie resonances

Do thin films have an effect on radiation budget?



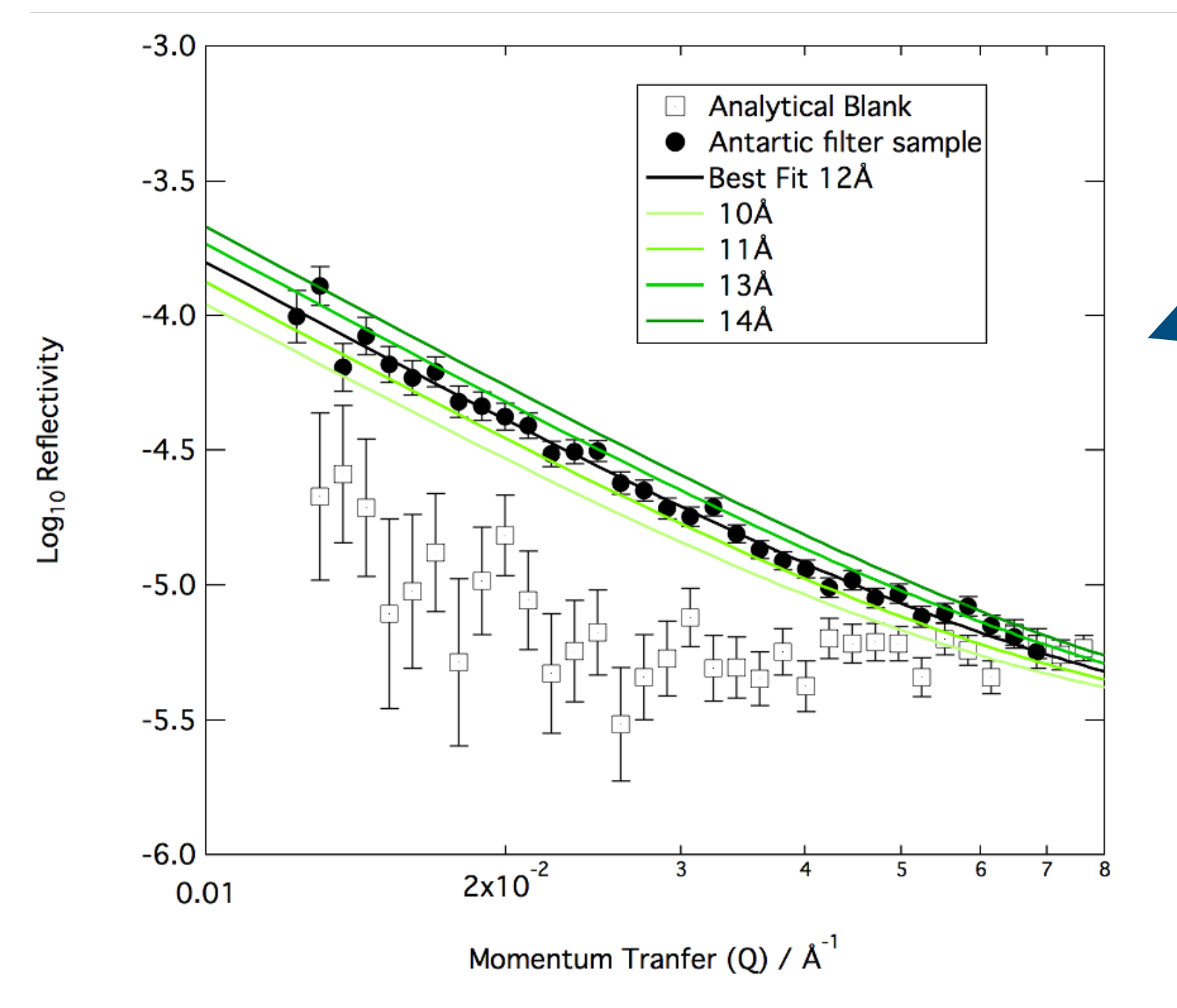
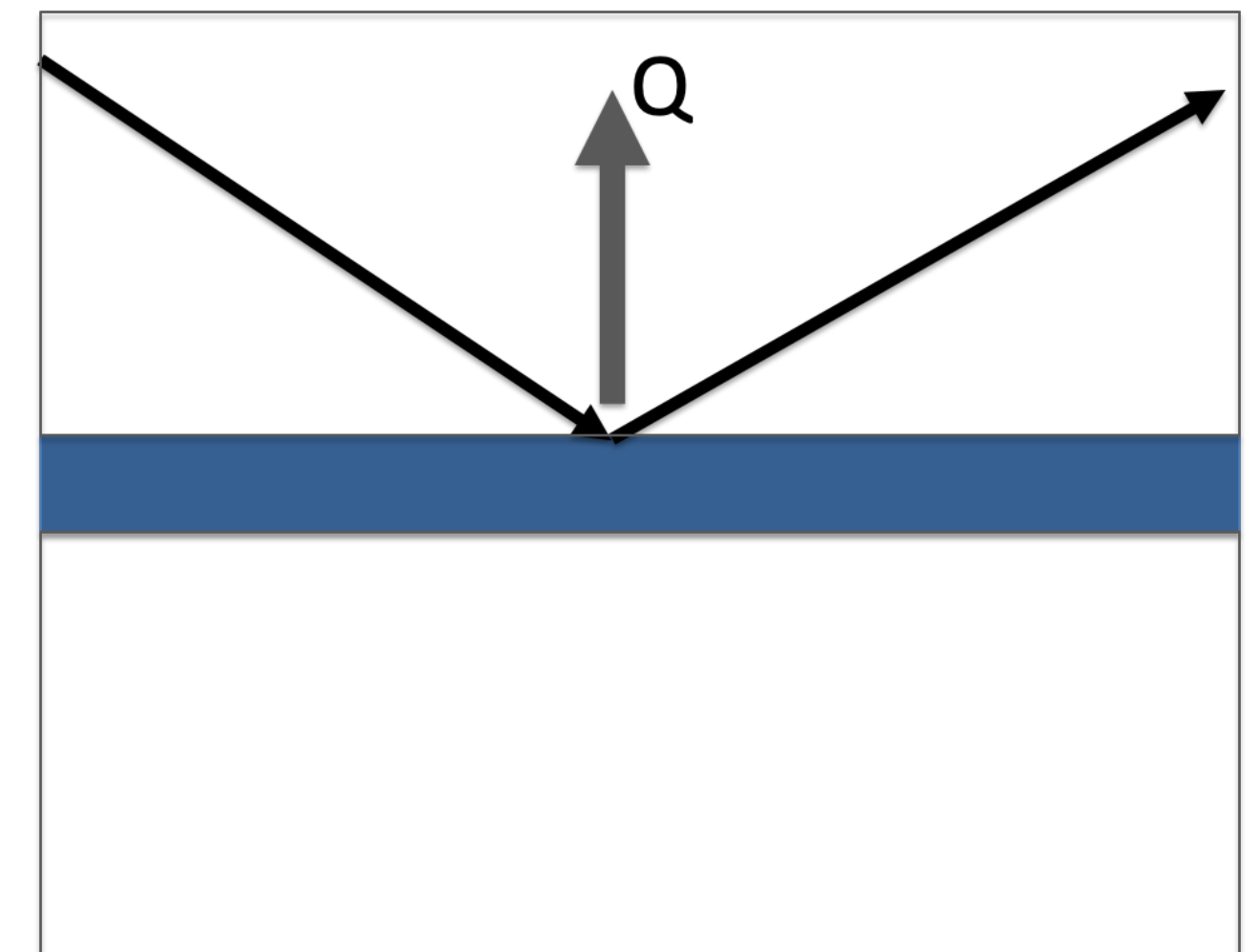
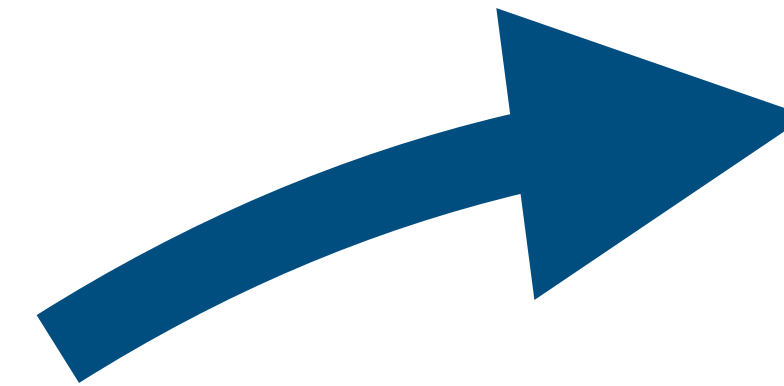
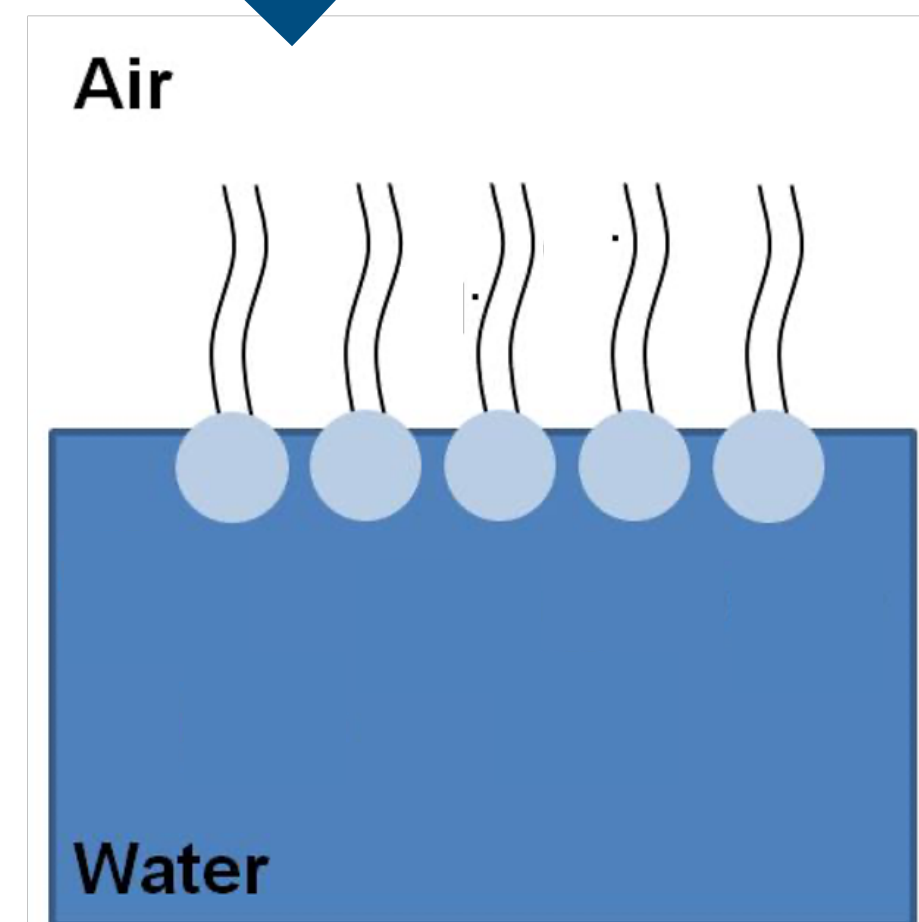
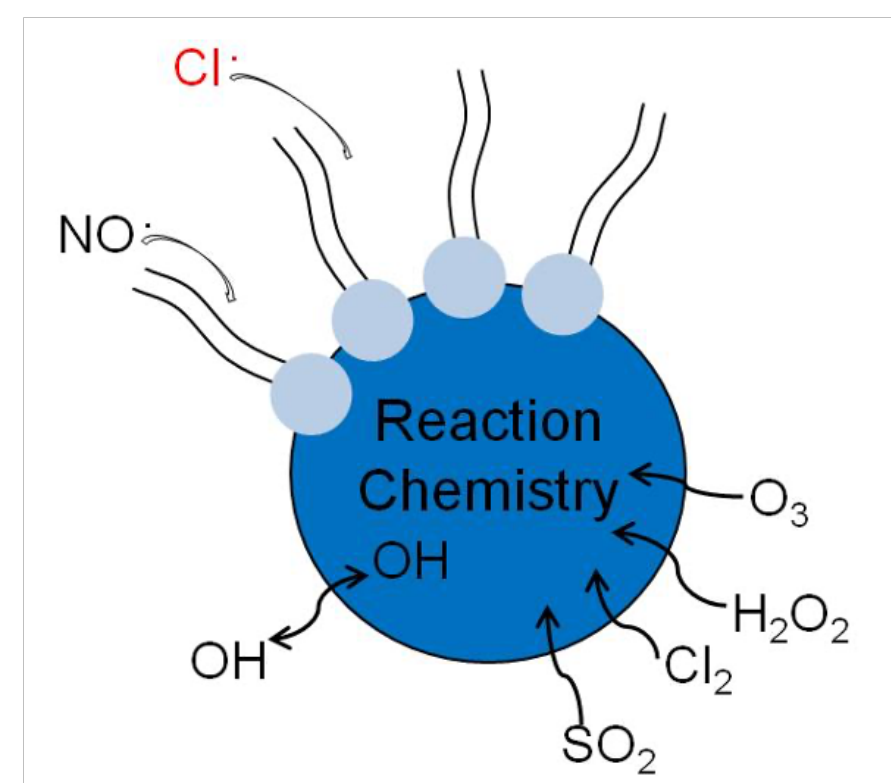
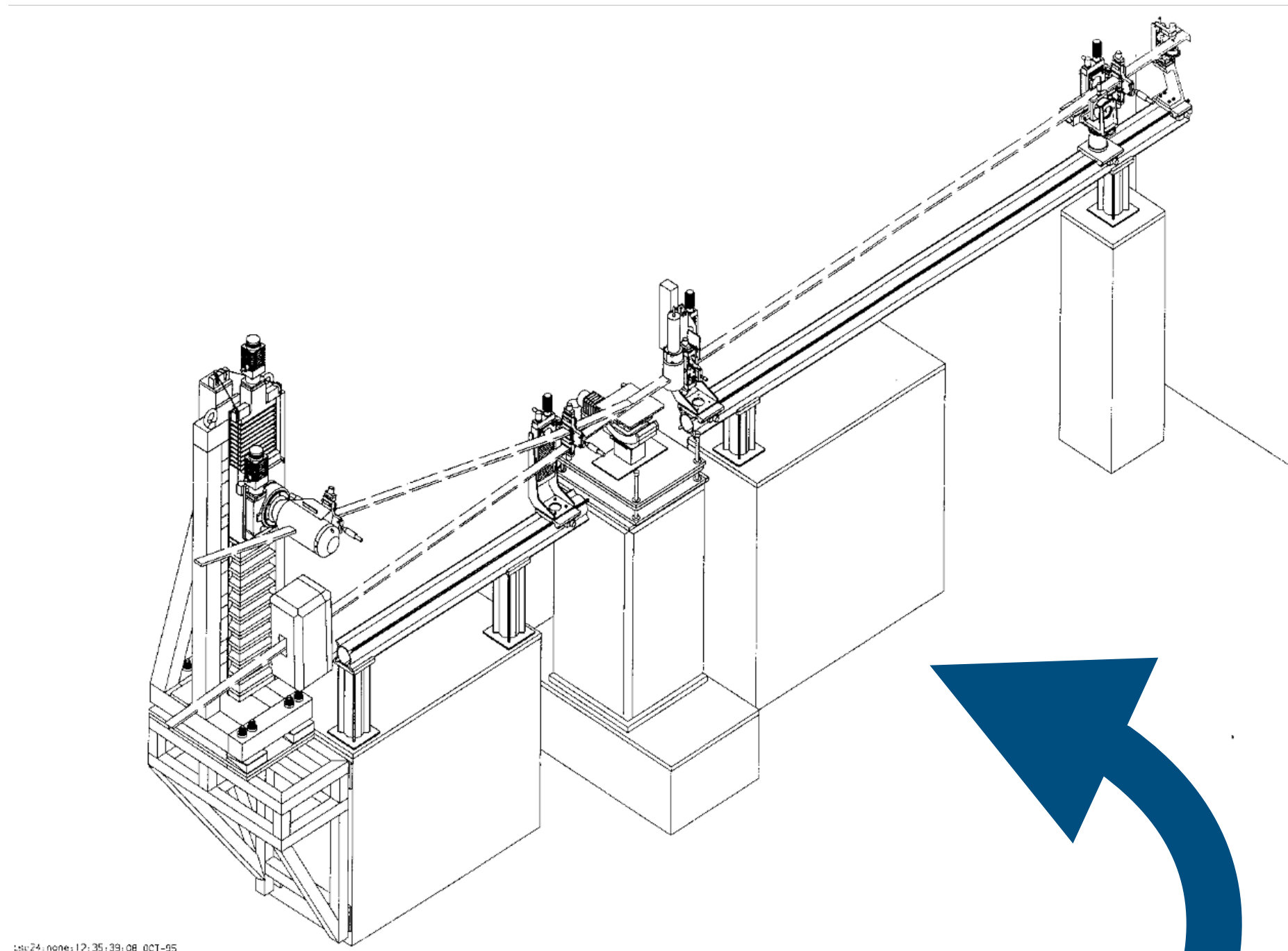
How long do these films survive
in the atmosphere?

Neutron Reflection

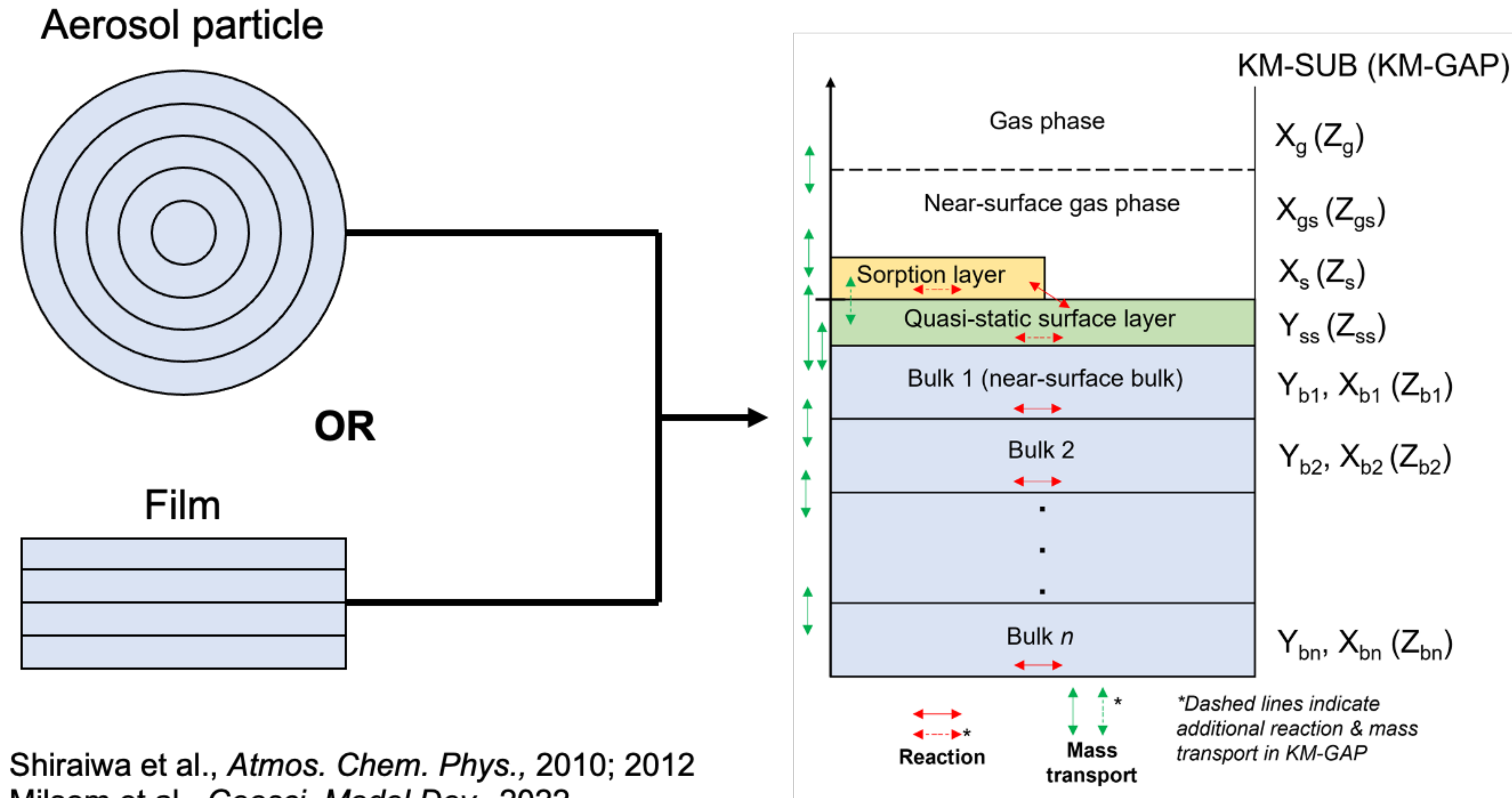


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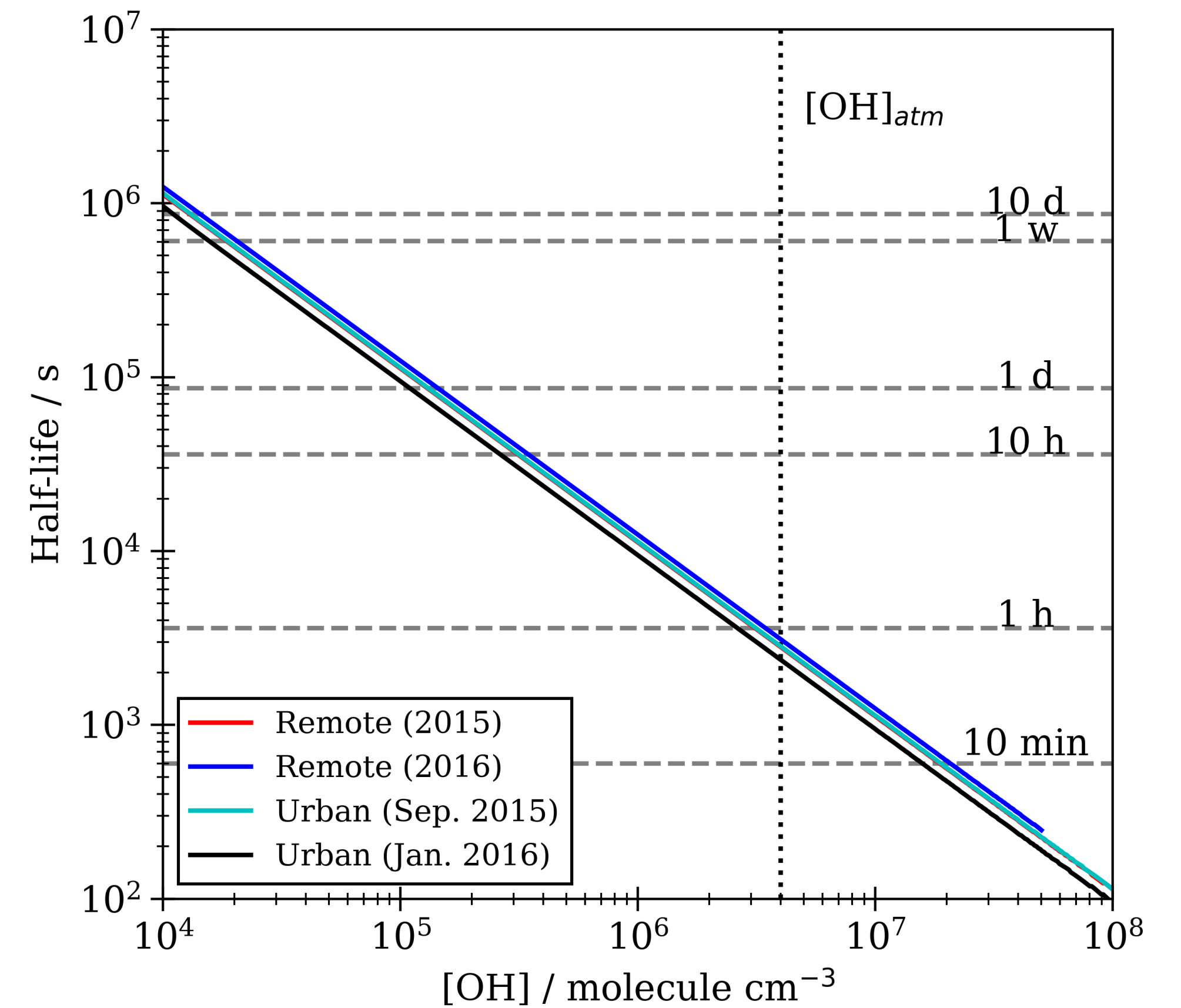
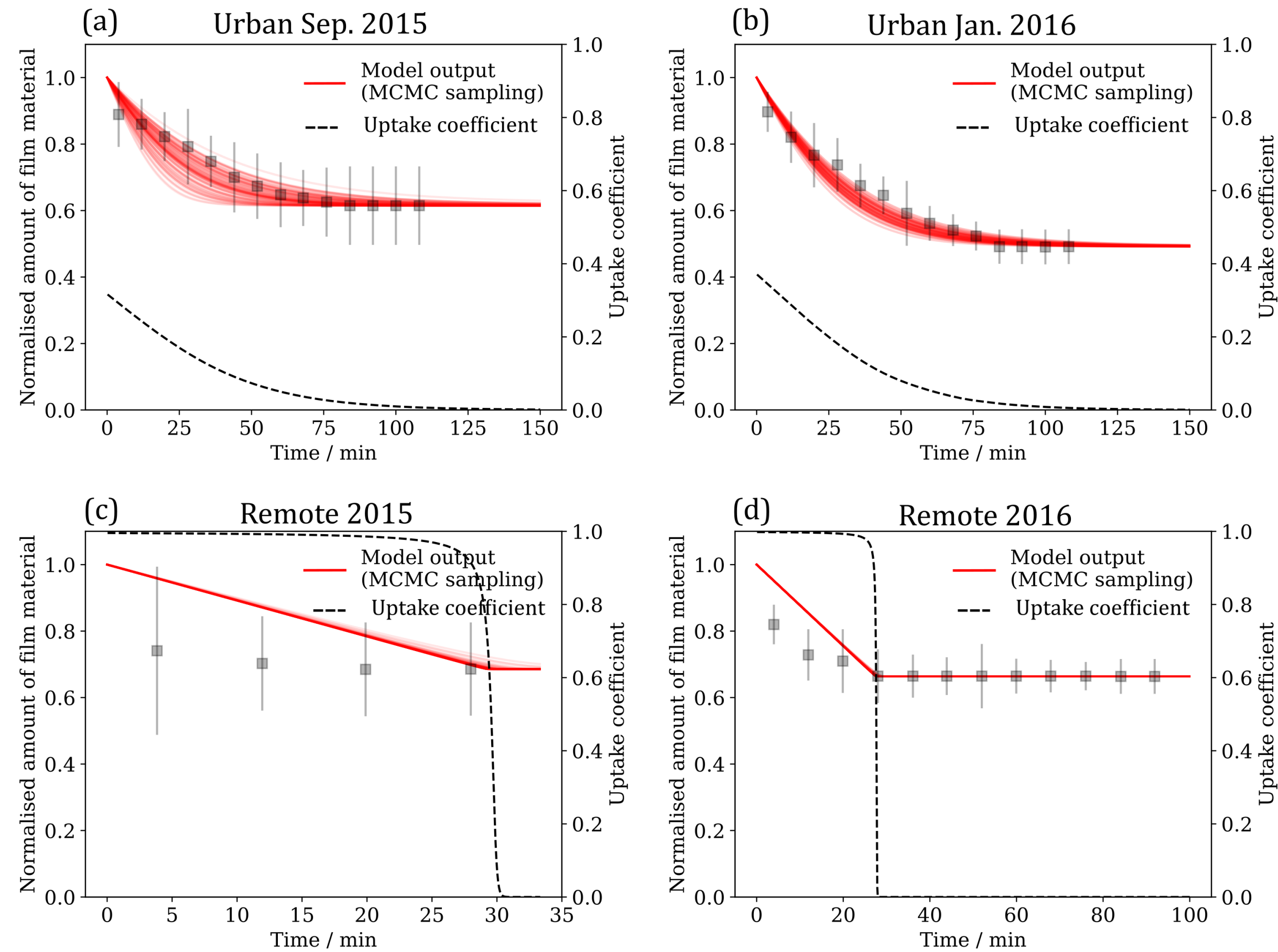
Kinetic multi-layer modelling



Shiraiwa et al., *Atmos. Chem. Phys.*, 2010; 2012
 Milsom et al., *Geosci. Model Dev.*, 2022

- Kinetic multi-layer model of aerosol surface and bulk chemistry (KM-SUB)
- Resolve concentration and diffusion gradients
- Can evolve particle/film diffusivity

What is the atmospheric lifetime with respect to oxidation?



Questions