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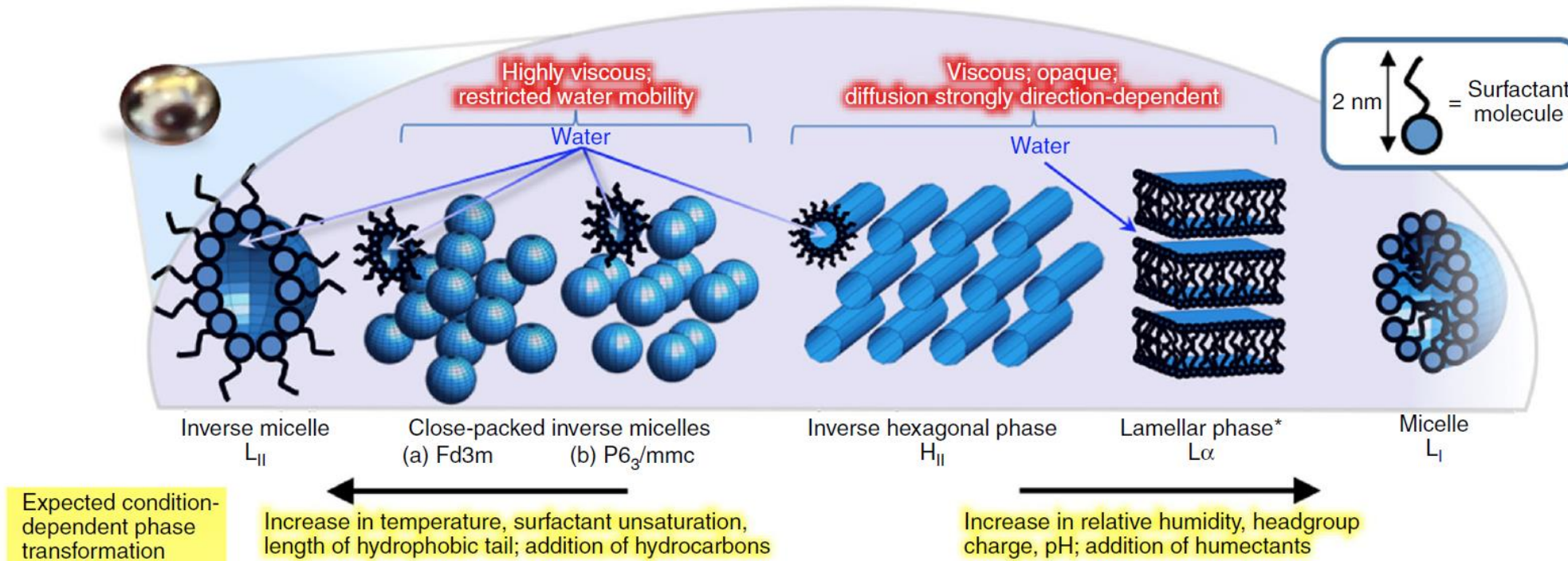
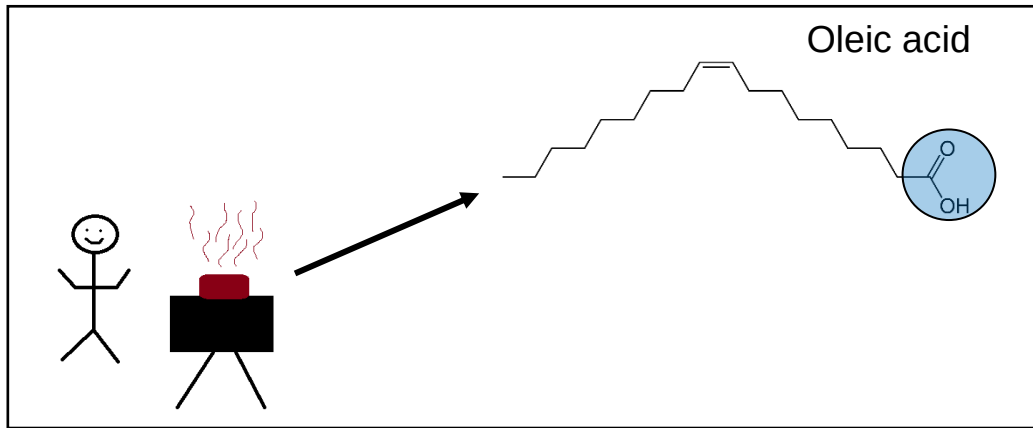
The impact of viscous self-organised phase formation on the lifetime of a fatty acid aerosol proxy

Adam Milsom

(Postdoctoral Researcher, University of Birmingham, UK)

Oleic acid – a surfactant cooking emission

Oleic acid lasts longer in the atmosphere than predicted in the lab, why?



Pfrang et al., *Nat. Commun.*, 2017, DOI: 10.1038/s41467-017-01918-1

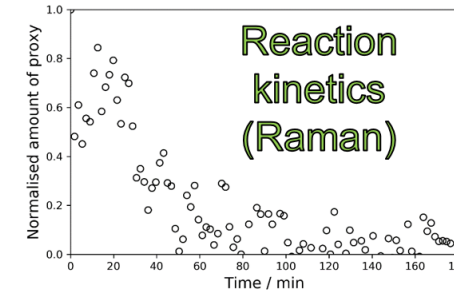
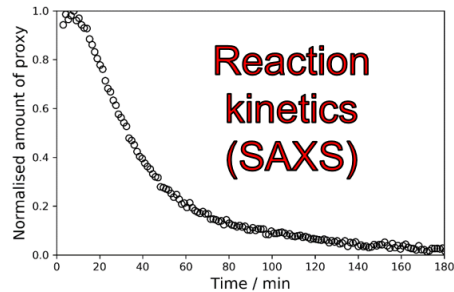
Measuring reaction kinetics with X-rays and lasers



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Complementary data

Raman peak analysis

532 nm Raman laser
(chemical kinetics)

O₃ / Humidity in

Scattered X-rays

Synchrotron X-rays

1-D data processing

SAXS/WAXS
detection
(structure and
chemical kinetics)

Quartz capillary coated with
a cooking aerosol proxy
(oleic acid + sodium oleate)

O₃ / Humidity out

Milsom et al., *Faraday Discuss.*, 2021, DOI: 10.1039/D0FD00088D

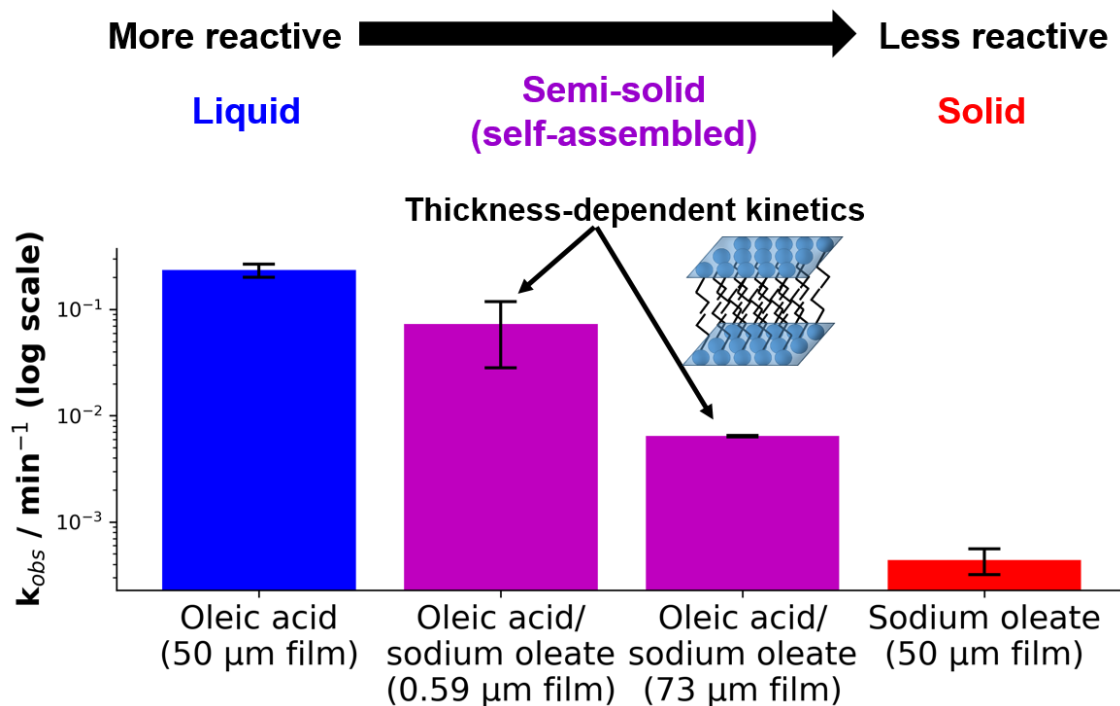
Measuring reaction kinetics



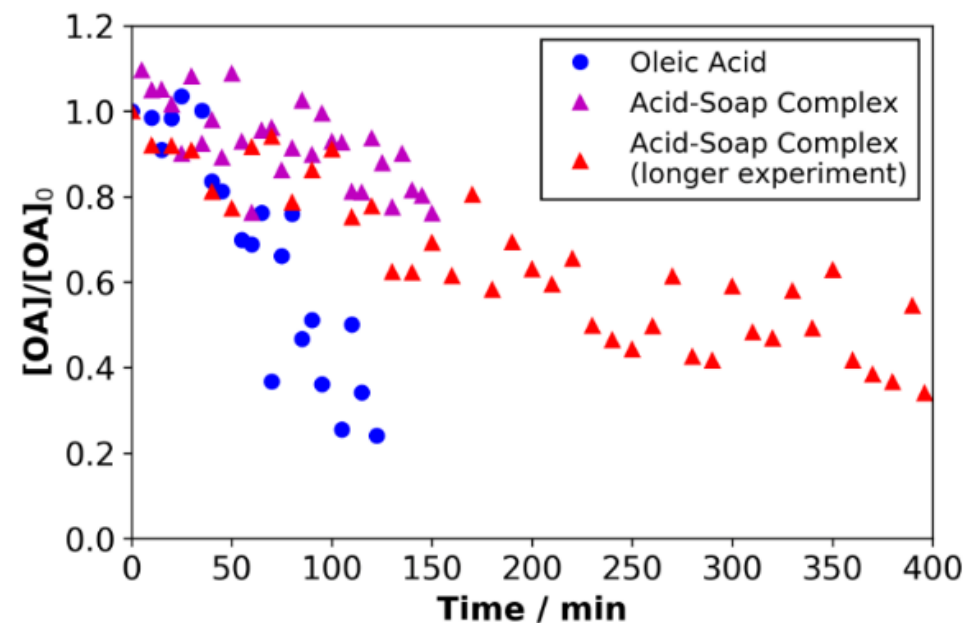
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Milsom et al., *Faraday Discuss.*, 2021, DOI: 10.1039/D0FD00088D



Milsom et al., *Atmos. Chem. Phys.*, 2021,
DOI: 10.5194/acp-21-15003-2021

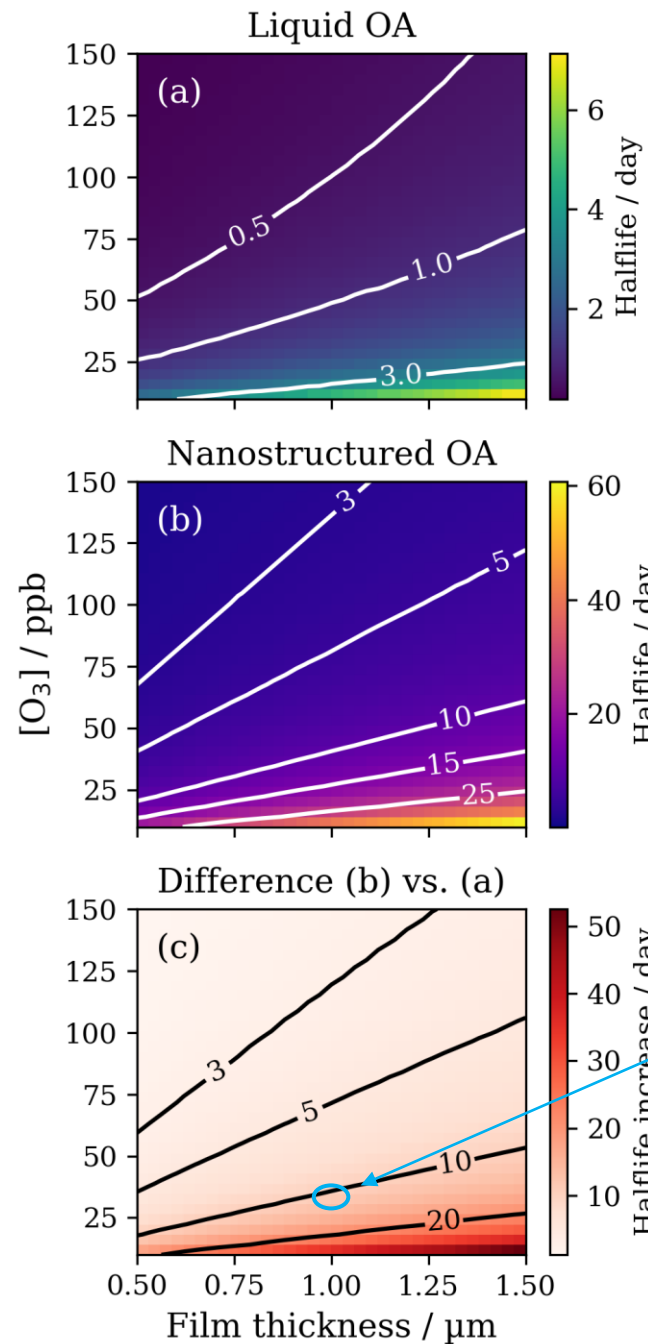
Atmospheric lifetime



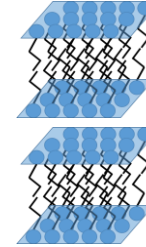
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Milsom et al., *Atmos. Chem. Phys.*, 2022,
DOI: 10.5194/acp-22-4895-2022



For a 1 μm film at ~30 ppb ~10 day increase in film half-life when going from liquid to nanostructured (lamellar) oleic acid



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than predicted in the lab, why?

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