



Supplement of

The role of organic condensation on ultrafine particle growth during nucleation events

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Supplementary material

TABLE S1. Major compounds for each lumped VOC within SAPRC99 (Tsimpidi et al., 2010).

Species	Major Components	Type of source	V-SOA precursors
ALK1	Ethane, Methyl Formate	Anthropogenic	No
ALK2	Propane, Cyclobutane, Ethyl Formate, Methyl Acetate	Anthropogenic	No
ALK3	n-Butane, Ethanol, Isobutane, Dimethyl, Butane, Dimethyl Pentane	Anthropogenic	No
ALK4	n-Pentane, n-Hexane, Branched C5-C6, Alkanes, Cyclopentane, Trimethyl Butane, Trimethyl Pentane, Isopropyl Alcohol, n-Propyl Alcohol	Anthropogenic	Yes
ALK5	C7-C22 n-Alkanes, C6-C16 Cycloalkanes, Branched/Unspeciated C8-C18 Alkanes	Anthropogenic	Yes
OLE1	Propene, C4-C15 Terminal Alkenes	Anthropogenic	Yes
OLE2	Isobutene, C4-C15 Internal Alkenes, C6-C15 Cyclic or di-olefins, Styrenes	Anthropogenic	Yes
ARO1	Toluene, Benzene, Ethyl Benzene, C9-C13 Monosubstituted Benzenes	Anthropogenic	Yes
ARO2	Xylenes, Ethyl Toluenes, Dimethyl and Trimethyl Benzenes, Ethylbenzenes, Naphthalene, C8-C13 Di-, Tri-, Tetra-,Penta-, Hexa-substituted Benzenes, Unspeciated C10-C12 Aromatics	Anthropogenic	Yes
TERP	α -pinene, β -pinene, Limonene, Carene, Sabinene, other monoterpenes	Biogenic	Yes
ISOP	Isoprene	Biogenic	Yes
SESQ	Sesquiterpenes	Biogenic	Yes

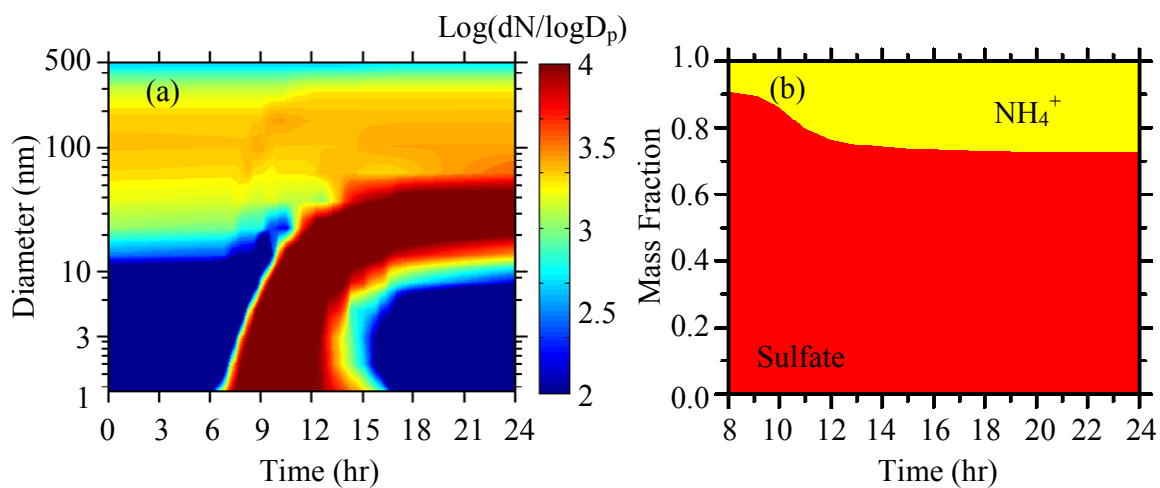


FIGURE S1: a) Predicted aerosol dry size distribution during a typical spring day with a nucleation event at Finokalia without condensation of organics. Particle number concentration is plotted against time of day (x-axis) and particle diameter (y-axis). b) Predicted composition of new particles.

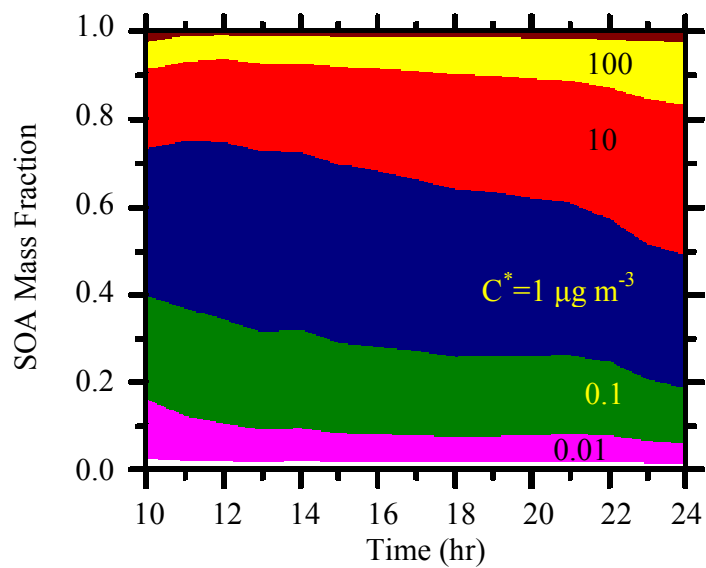


FIGURE S2: Predicted composition of organic aerosol in the new particles for different effective saturation concentrations with $\sigma = 0.025 \text{ N m}^{-1}$ at Hyytiala.

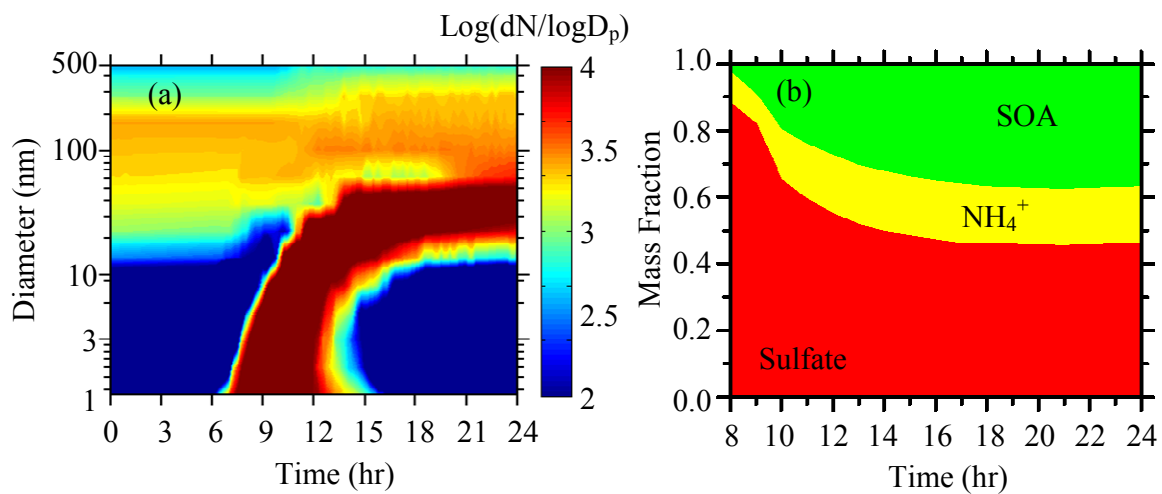


FIGURE S3: Simulation with surface tension of 0.025 N m^{-1} at Finokalia: a) predicted particle size distribution and b) the composition of nucleated particles.

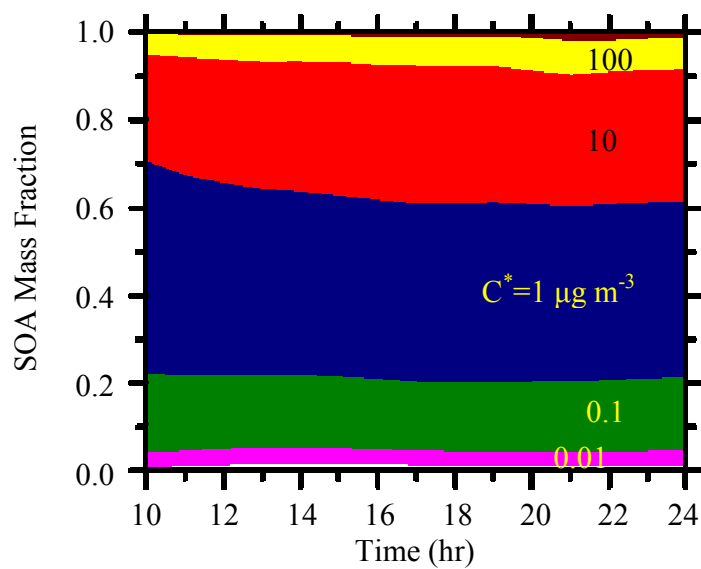


FIGURE S4: Predicted composition of organic aerosol in the new particles for different effective saturation concentrations with $\sigma = 0.025 \text{ N m}^{-1}$ at Hyytiala.

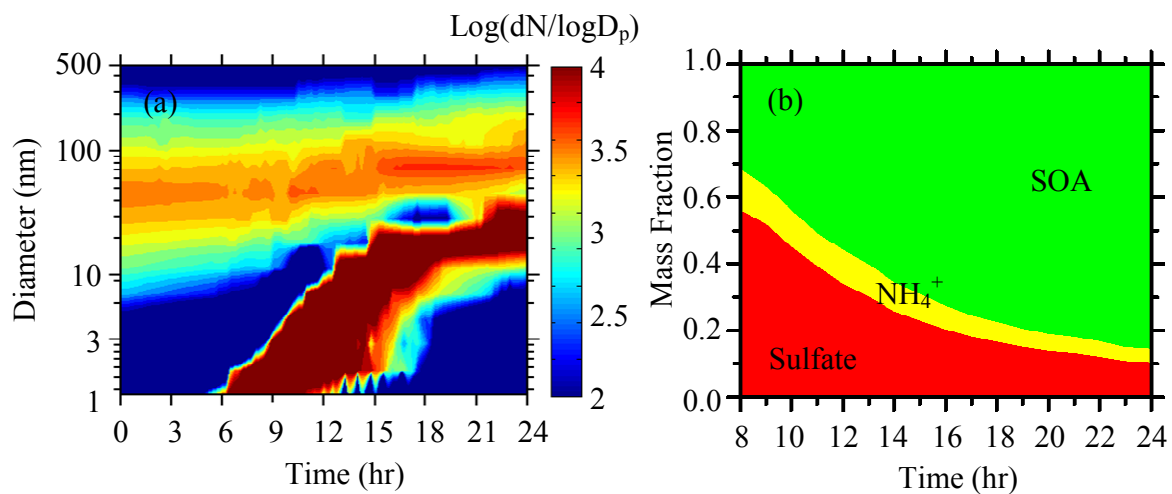


FIGURE S5: Simulation with condensation of organics neglecting the Kelvin effect at Hyytiala: a) predicted aerosol dry size distribution and b) composition of nucleated particles.

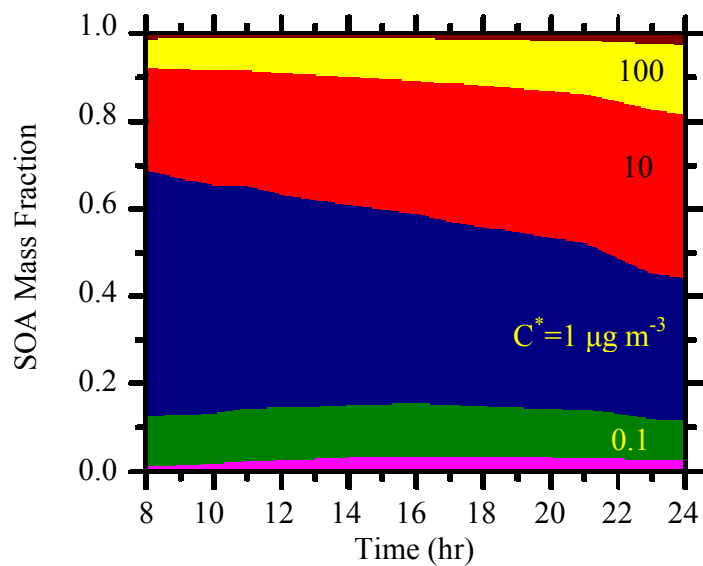


FIGURE S6: Predicted composition of organic aerosol in the new particles for different effective saturation concentrations with zero surface energy at Hyytiala.

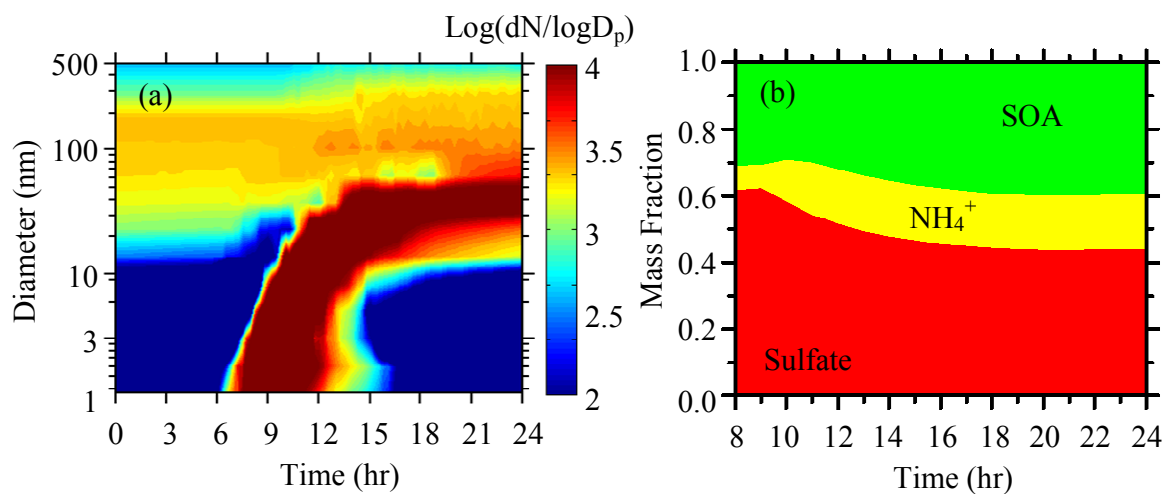


FIGURE S7: Simulation with condensation of organics neglecting the Kelvin effect at Finokalia as function of local time: a) predicted particles size distribution and b) the composition of nucleated particles.

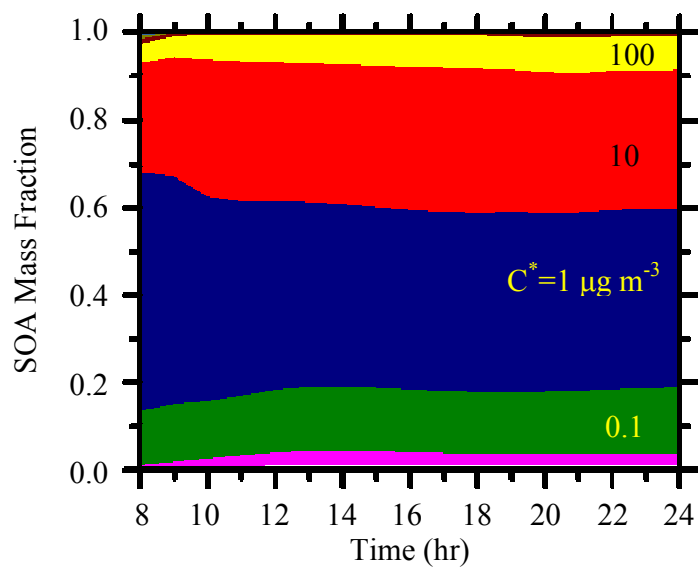


FIGURE S8: Predicted composition of organic aerosol in the new particles for different effective saturation concentrations with zero surface energy at Finokalia.

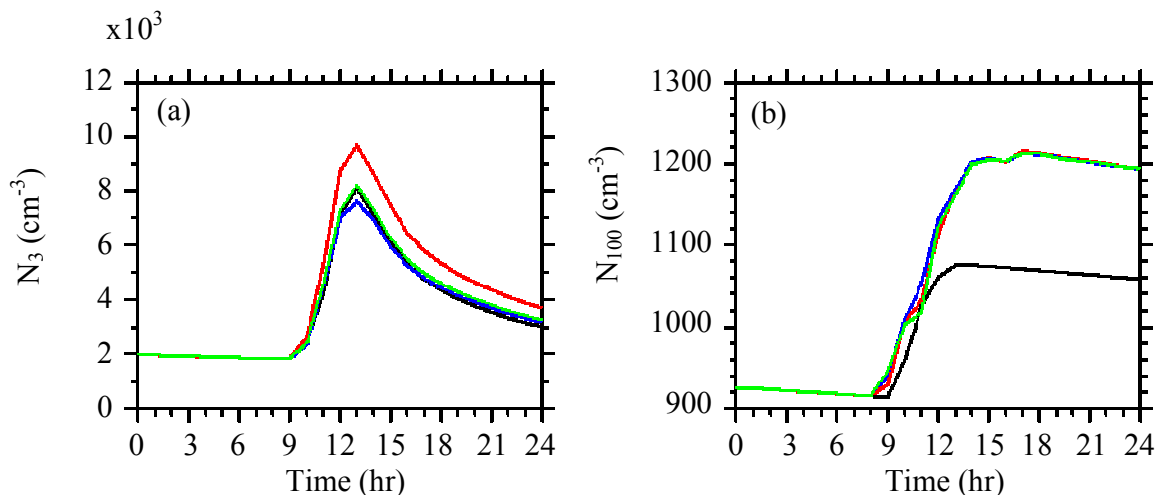


FIGURE S9: Predicted concentrations of a) N_3 and b) N_{100} at Finokalia for the four simulated cases. Black line represents no condensation of organics, red is with condensation of organics with $\sigma = 0.0 \text{ N m}^{-1}$, blue is with condensation of organics with $\sigma = 0.025 \text{ N m}^{-1}$ and green is condensation of organics with biogenic aging reactions and $\sigma=0.025 \text{ N m}^{-1}$.