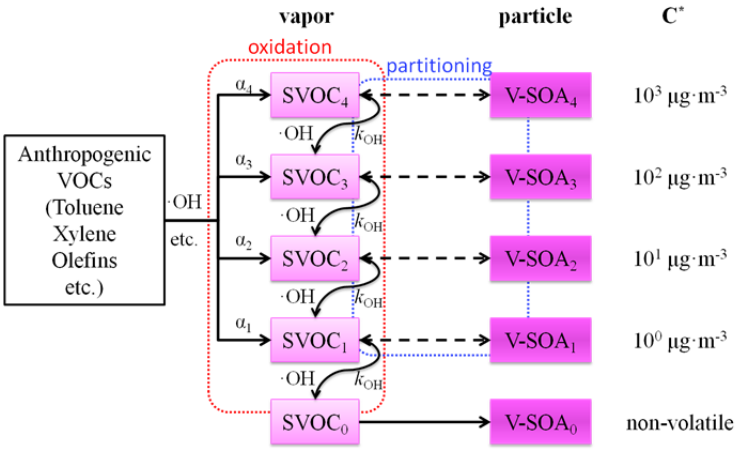
Table S1. POA chemical aging scheme (Koo et al. 2014)

POA basis set	Oxidation reaction
Hydrocarbon-like OA	P-SVOC$_1$ + OH →0.864 P-SVOC$_0$ + 0.142 SVOC$_0$
	P-SVOC$_2$ + OH →0.877 P-SVOC$_1$ + 0.129 SVOC$_1$
	P-SVOC$_3$ + OH →0.889 P-SVOC$_2$ + 0.116 SVOC$_2$
	P-SVOC$_4$ + OH →0.869 P-SVOC$_3$ + 0.137 SVOC$_3$
biomass burning OA	P-SVOC$_1$ + OH →0.538 P-SVOC$_0$ + 0.464 SVOC$_0$
	P-SVOC$_2$ + OH →0.689 P-SVOC$_1$ + 0.313 SVOC$_1$
	P-SVOC$_3$ + OH →0.783 P-SVOC$_2$ + 0.220 SVOC$_2$
	P-SVOC$_4$ + OH →0.846 P-SVOC$_3$ + 0.156 SVOC$_3$

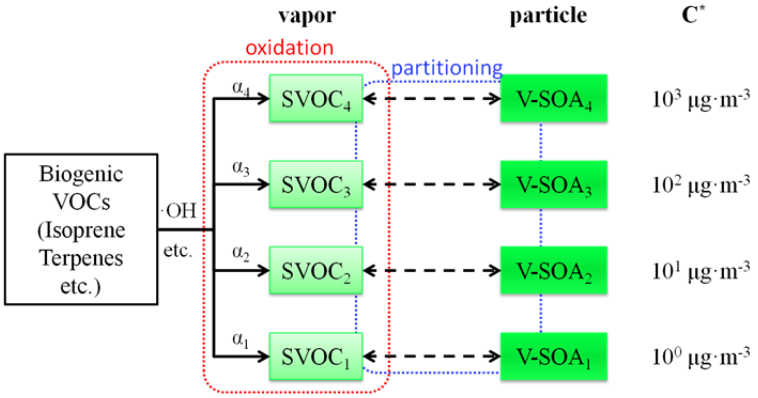
Table S2. SOA mass yields for the VOCs and IVOCs precursors and volatility bins used in this box model

precursors	High NO_x conditions				Low NO_x conditions			
	1	10	100	1000	1	10	100	1000
ARO1	0.003	0.165	0.300	0.435	0.075	0.225	0.375	0.525
ARO2	0.002	0.195	0.300	0.435	0.075	0.300	0.375	0.535
OLET	0.001	0.005	0.038	0.150	0.005	0.009	0.060	0.225
OLEI	0.003	0.026	0.083	0.270	0.023	0.044	0.129	0.375
ISOP	0.000	0.023	0.015	0.000	0.009	0.030	0.015	0.000
TERP	0.012	0.122	0.201	0.507	0.107	0.092	0.359	0.607
IVOCs	0.030	0.194	0.264	0.376	0.030	0.194	0.264	0.376

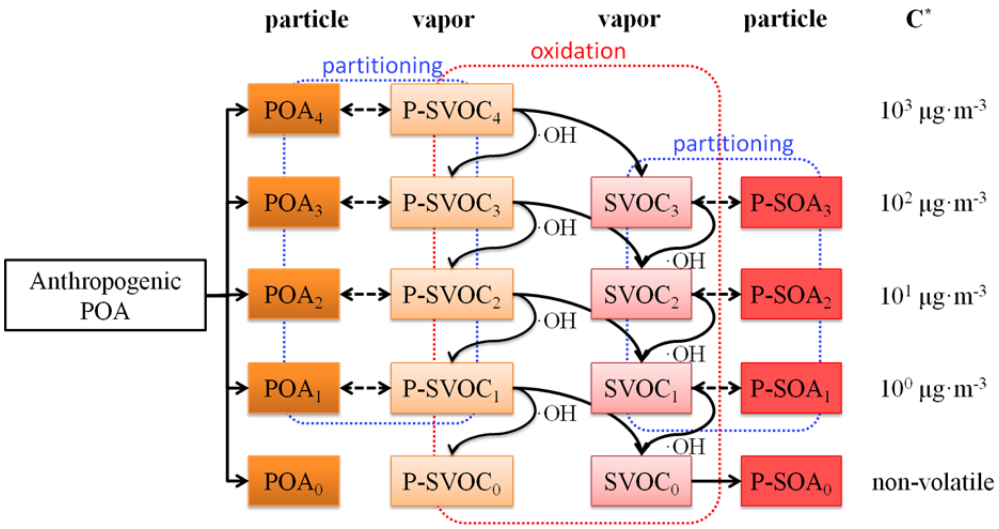
(a) anthropogenic VOCs



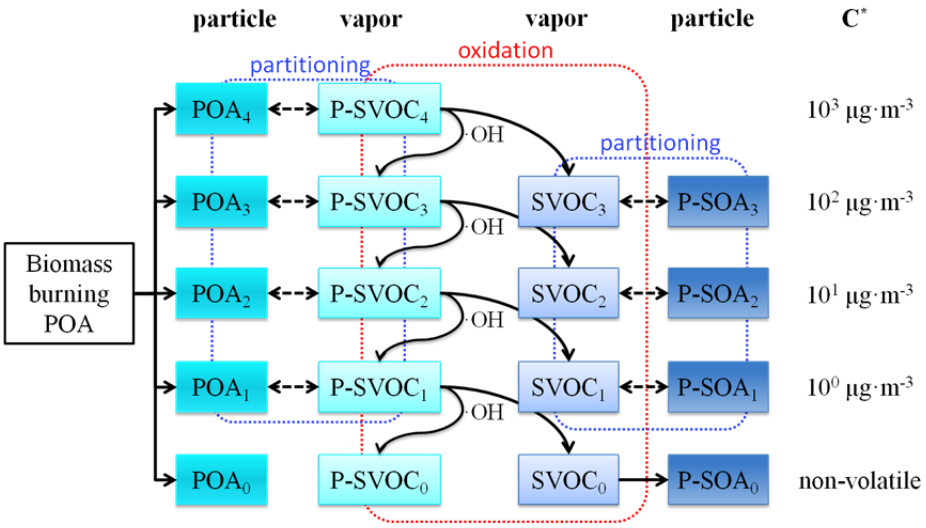
(b) biogenic VOCs



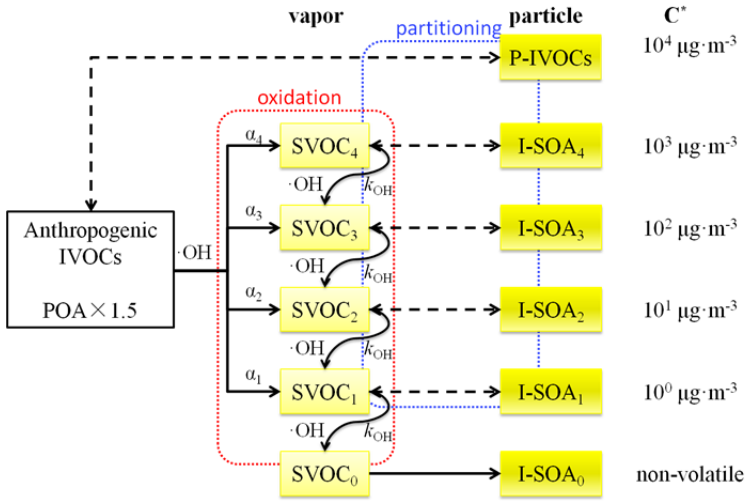
(c) anthropogenic POA



(d) biomass burning POA



(e) anthropogenic IVOCs



(f) biomass burning IVOCs

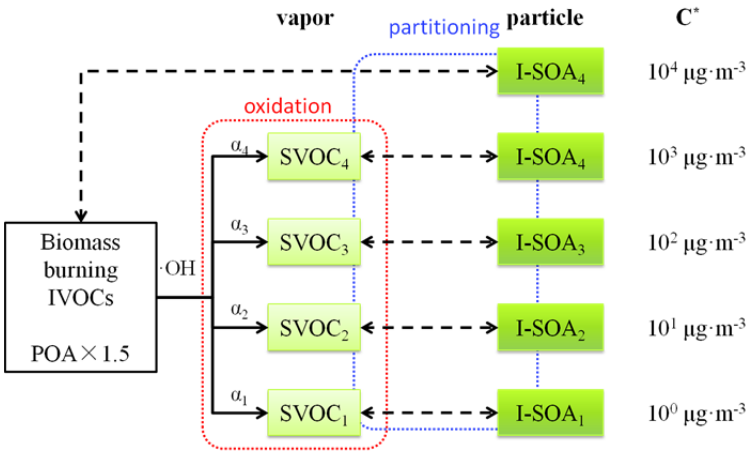


Fig. S1 Conceptual diagram of components of SOA scheme in this study