

Figure S1. Example of spatial temperature distribution for the thermodenuder model configuration in this study. Initial temperature=25° C, wall temperature= 100°C.

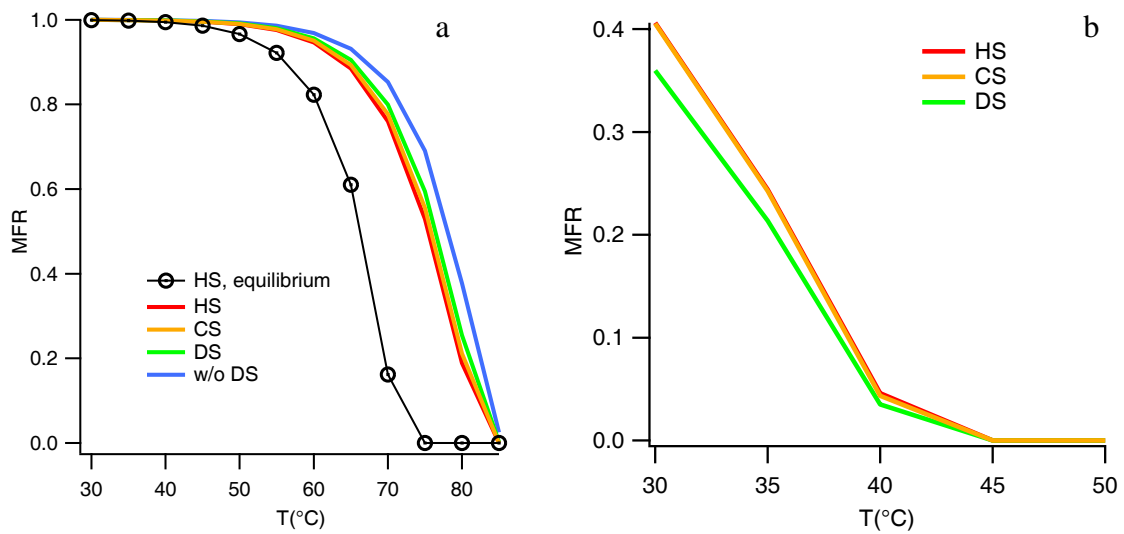


Figure S2. (a) Heating section (HS), cooling section (CS), denuder section (DS) and cooling section without denuder (w/o DS) output thermograms for 30  $\mu\text{g}/\text{m}^3$  aerosol mass loading. Baseline case:  $C^*=0.01 \mu\text{g}/\text{m}^3$ ,  $d_{p0}=100 \text{ nm}$ ,  $D_i=5\text{e-}6 \text{ cm}^2/\text{s}$  and  $\alpha=1$ . (b) Heating section (HS), cooling section (CS) and denuder section (DS) output thermograms for 20  $\mu\text{g}/\text{m}^3$  aerosol mass loading. Baseline case:  $C^*=10 \mu\text{g}/\text{m}^3$ ,  $d_{p0}=100 \text{ nm}$ ,  $D_i=5\text{e-}6 \text{ cm}^2/\text{s}$  and  $\alpha=1$ .

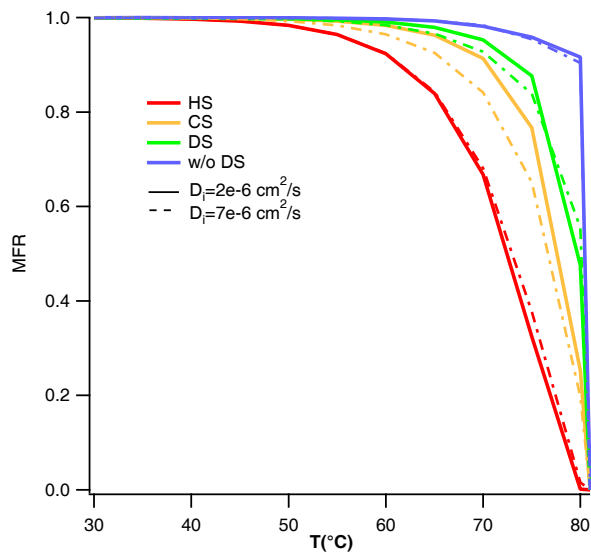


Figure S3. Output thermograms and recondensation fraction for the heating section (HS), cooling section (CS), denuder section (DS) and equivalent configuration without denuder section (w/o DS) for different diffusion coefficients. Baseline case:  $C_{OA} = 400 \text{ } \mu\text{g}/\text{m}^3$ ;  $C^* = 0.01 \text{ } \mu\text{g}/\text{m}^3$ ,  $d_{p0} = 100 \text{ nm}$ ,  $D_i = 5 \times 10^{-6} \text{ cm}^2/\text{s}$  and  $\alpha = 1$ .

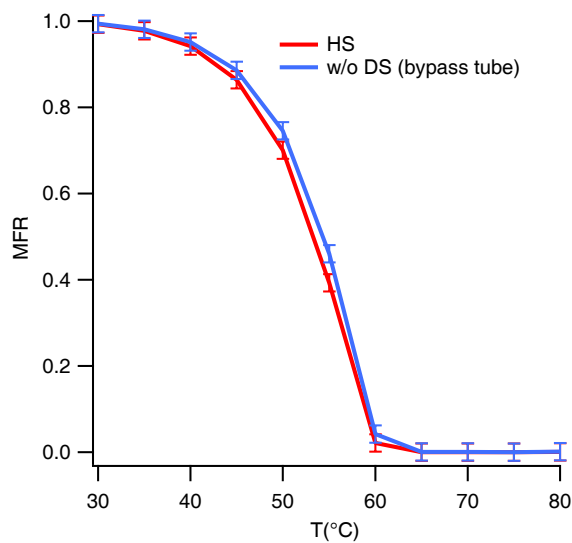


Figure S4. Modeled thermograms of adipic acid aerosol in the re-condensation test experiments by Saleh et al. (2011) (initial aerosol loading:  $287 \text{ } \mu\text{g}/\text{m}^3$ , flow=1 lpm, by-pass tube length=2 m). HS: heating section output thermogram. w/o DS: output thermogram of cooling section without denuder. Error bars indicate the uncertainty in measurements by Saleh et al. (2011). Re-condensation is negligible in this particular case due to the short residence time of the fluid in the by-pass tube without denuder (3.74 s) and the low accommodation coefficient of the aerosol sample ( $\alpha = 0.1$ ).

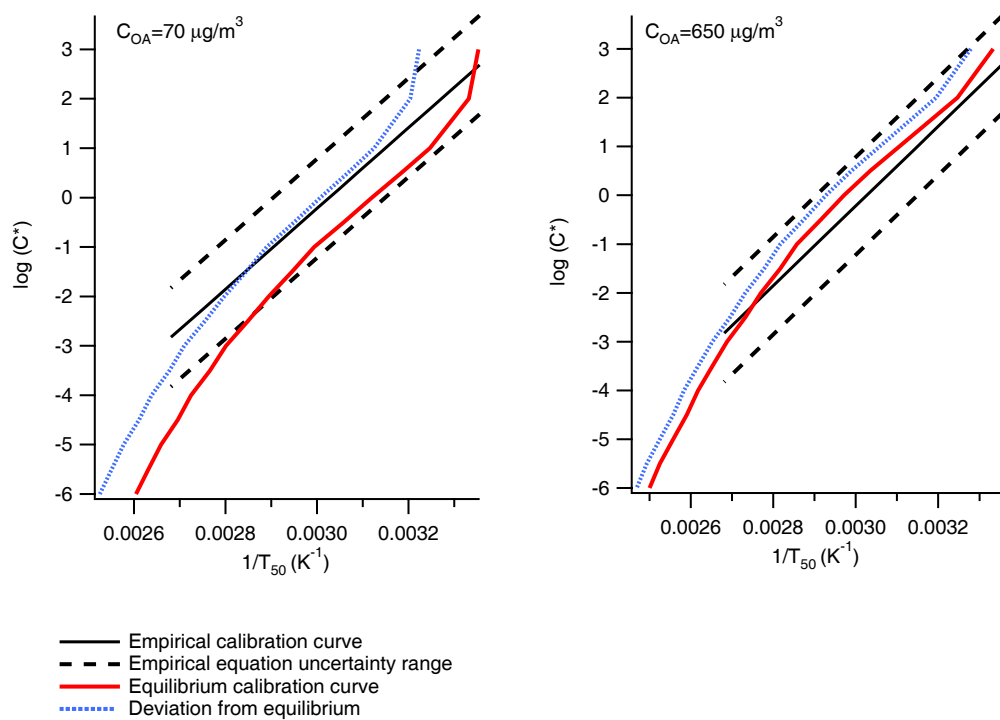


Fig S5. Deviation of calibration curve from the equilibrium and empirical curves in experiments with lubricating oil aerosol at 70 and 650  $\mu\text{g}/\text{m}^3$  mass loading.

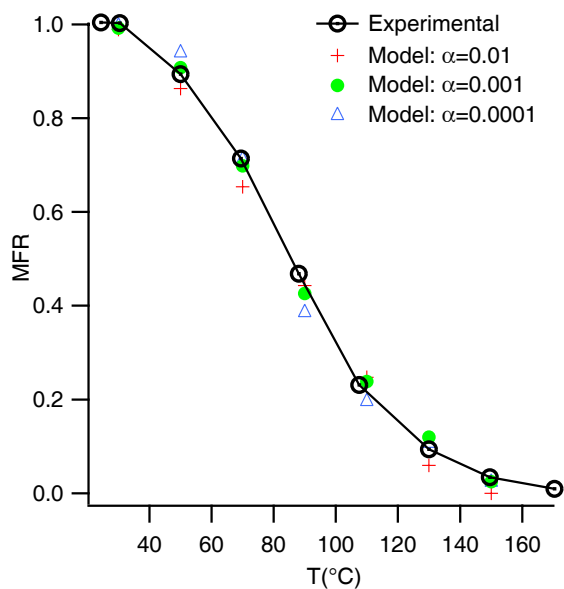


Fig S6. Kinetic model fitting to experimental thermogram of  $\alpha$ -pinene SOA at 500  $\mu\text{g}/\text{m}^3$  initial aerosol loading (Cappa and Wilson, 2011). A good agreement between the model and experimental data is achievable for different accommodation coefficient values.