

Supplementary material

Secondary organic aerosol formation from methacrolein photooxidation: roles of NO_x level, relative humidity and aerosol acidity

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Initial size distribution comparison between the wet and dry experiments

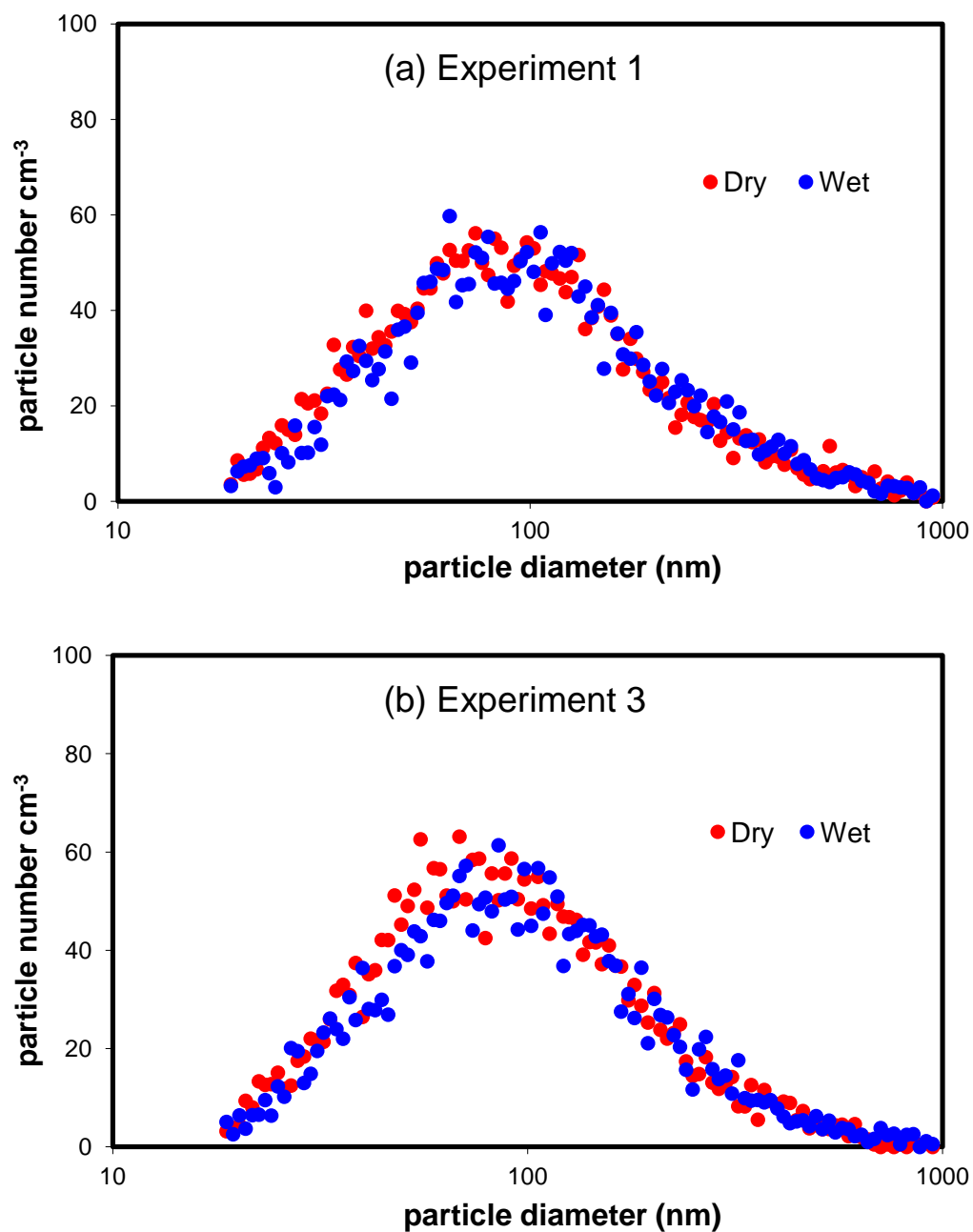


Fig. S1. Initial size distribution comparison between the wet and dry experiments: (a) Experiment 1 (1D and 1W); (b) Experiment 3 (3D and 3W). The red dots represent the dry experiments (D) and the blue dots represent the wet experiments (W).

SOA formation from the highest initial NO experiments (Experiment 5 and 6)

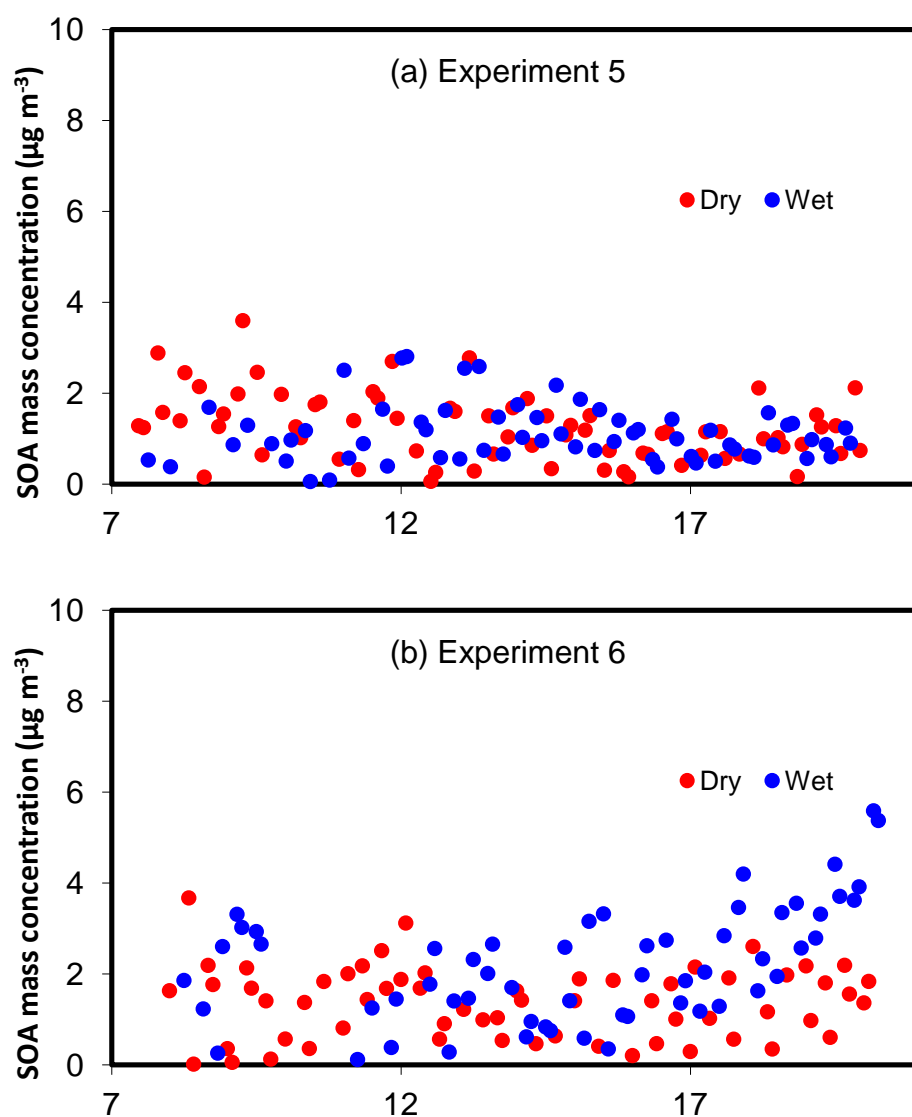


Fig. S2. SOA formation from (a) Experiment 5 (5D and 5W) and (b) Experiment 6 (6D and 6W). The red dots represent the dry experiments (D) and the blue dots represent the wet experiments (W).

Mass spectrums of 2-MG and the diester of 2-MG from GC/MS

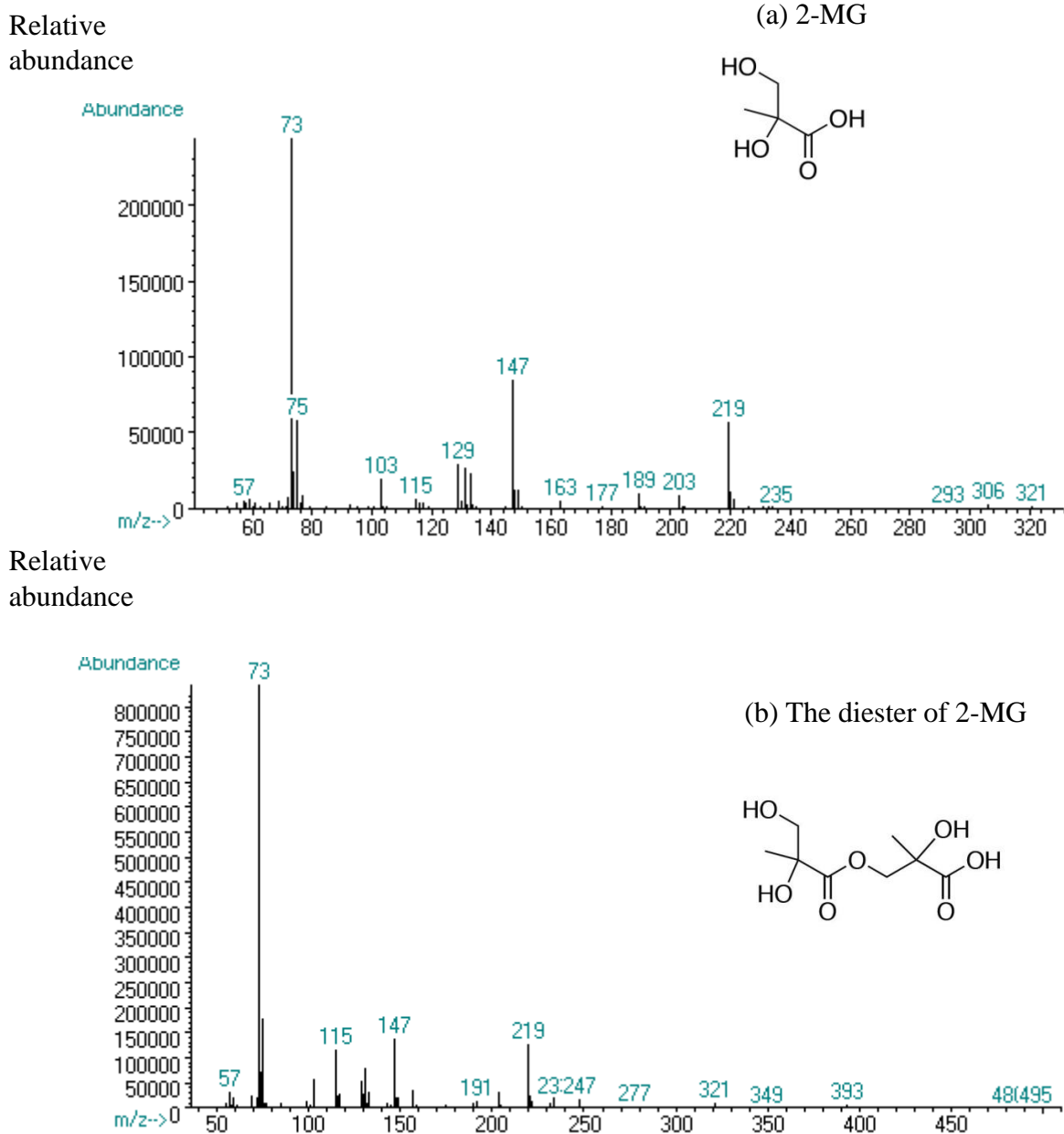


Fig. S3. GC/MS mass spectrums of 2-MG (a) and its diester (b).

Detail dates of chamber experiments (for records)

Table S1. Outdoor smog chamber experimental conditions

Outdoor smog chamber temperature varying from 280 to 317 K. Experiment dates in YYYYMMDDN/S format, where MMM is the three-letter month initials, DD is the experiment day, YYYY is the experiment year and N or S represents chamber side in which experiment was performed (N, north side; S, south side). Experimental IDs ending with ‘D’ indicates the experiment was performed under dry conditions; experimental IDs ending with ‘W’ indicates the experiment was performed under wet conditions. Furthermore, experimental IDs ending with ‘A’ or ‘N’ indicates the experiment was performed under acidic or neutral conditions. RH in each experiment started with the higher value in the given range and dropped to the lower value in the middle of the day

Date	ID	Initial isoprene (ppbv)	Initial methacrolein (ppbv)	Initial [NO] (ppb)	Initial [NO ₂] (ppb)	Initial [NO _x] (ppb)	Temperature (K)	RH range (%)	Initial seed mass (µg m ⁻³)
2011AUG09N	1D		490	203	14	217	294–315	10–18	14.9
2011AUG09S	1W		490	169	74	243	294–315	31–74	16.5
2011OCT17N	2D		450	258	20	278	283–307	8–18	26.6
2011OCT17S	2W		480	241	33	274	283–307	20–74	21.7
2011SEP19N	3D		240	269	16	285	291–300	14–18	14.3
2011SEP19S	3W		250	251	40	291	291–300	42–58	12.4
2011OCT02N	4D		250	263	3	266	280–300	20–26	7.5
2011OCT02S	4W		250	258	9	267	280–300	45–73	12.4
2011AUG24N	5D		250	688	30	718	290–311	8–16	11.5
2011AUG24S	5W		250	647	74	721	290–311	21–60	9.9
2011SEP14N	6D		250	509	19	528	289–312	9–18	15.0
2011SEP14S	6W		250	475	56	531	289–312	27–82	16.8
2011NOV08N	7A		230	142	7	149	285 – 300	60 -70	30.4
2011NOV08S	7N		240	143	5	148	285–300	66–77	26.1
2011AUG02N	8D	780		223	43	266	293–317	4.5–11	12.1
2011AUG02S	8W	820		202	54	256	293–317	15–43	11.9
2011SEP03N	9D	210		691	8	699	292–314	8–14	46.6
2011SEP03S	9W	210		662	53	715	292–314	22–55	48.1