Supplement of Atmos. Chem. Phys., 19, 13591–13609, 2019
https://doi.org/10.5194/acp-19-13591-2019-supplement

Atmospheric Chemistry and Physics
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EGU

Supplement of

Secondary organic aerosol formation from photooxidation of furan: effects of NO_x and humidity

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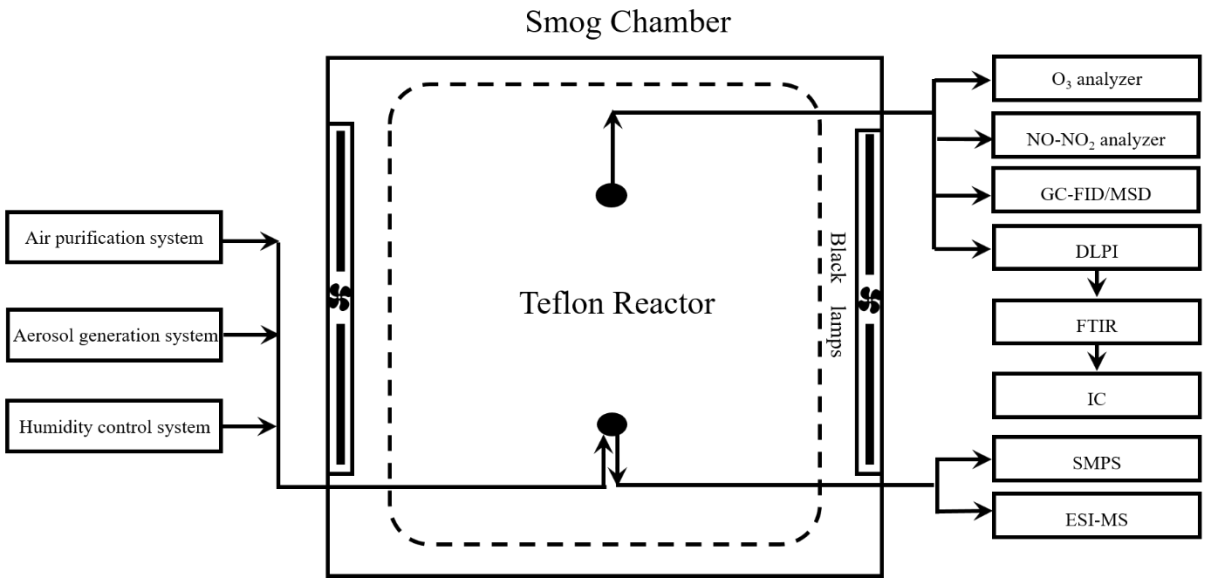

Figure S1: Schematic of the experimental set-up employed in this study.

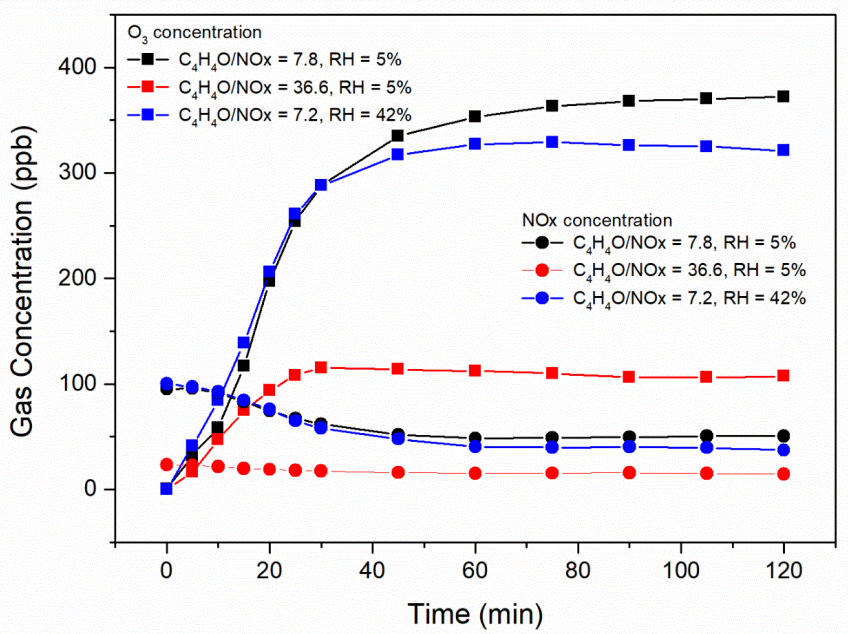

Figure S2: Comparisons of the observed concentrations of O_3 (square) and NOx (circle) from furan irradiations at different experimental conditions.

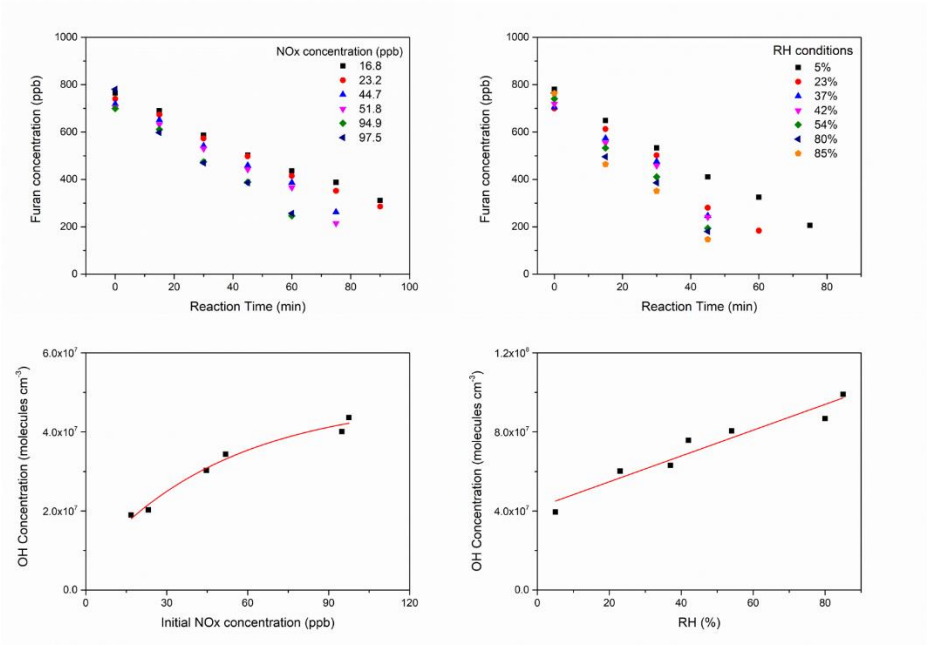

Figure S3: Relationship between relative NOx concentrations, humidity, and steady OH concentration in the furan photooxidation experiments performed under different NOx levels and RH conditions. The OH concentration was calculated based on [OH]= $\ln\frac{[furan]_0}{[furan]_t}/kt$, k=4.01× 10^{-11} cm^3 $molecules^{-1}$ s^{-1} (Atkinson et al., 1983).

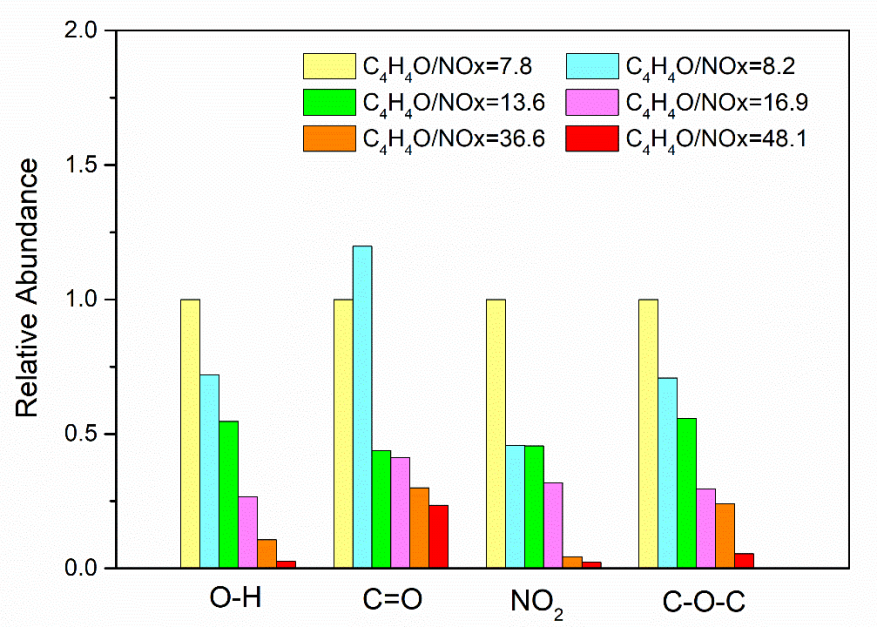

Figure S4: Variations of the relative abundance of different functional groups with C_4H_4O/NOx ratios from 7.8 to 48.1. Absolute abundances are normalized with respect to the corresponding functional abundance detected at C_4H_4O/NOx=7.8.

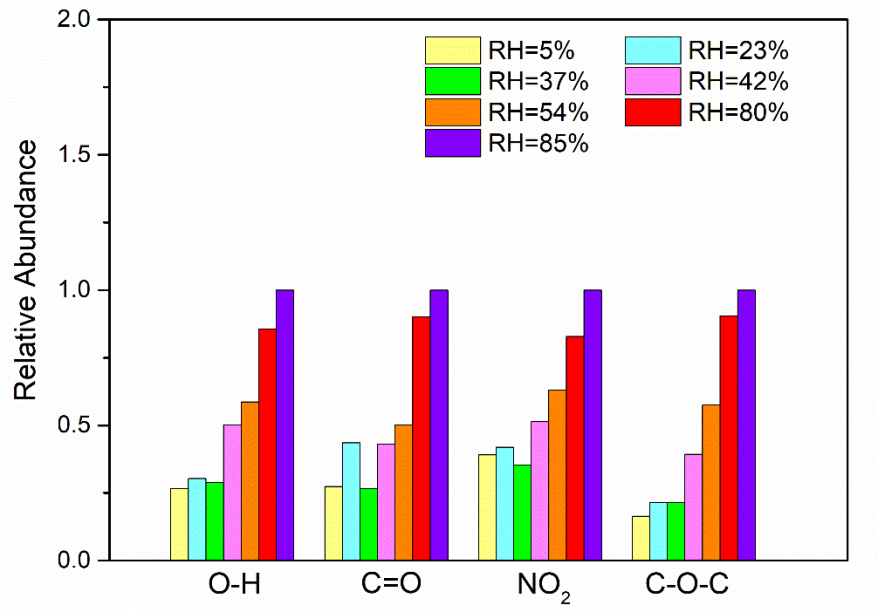

Figure S5: Variations of FTIR absorption abundance of different functional groups at RH from 5% to 85% relative to the absolute abundance detected at RH 85%.

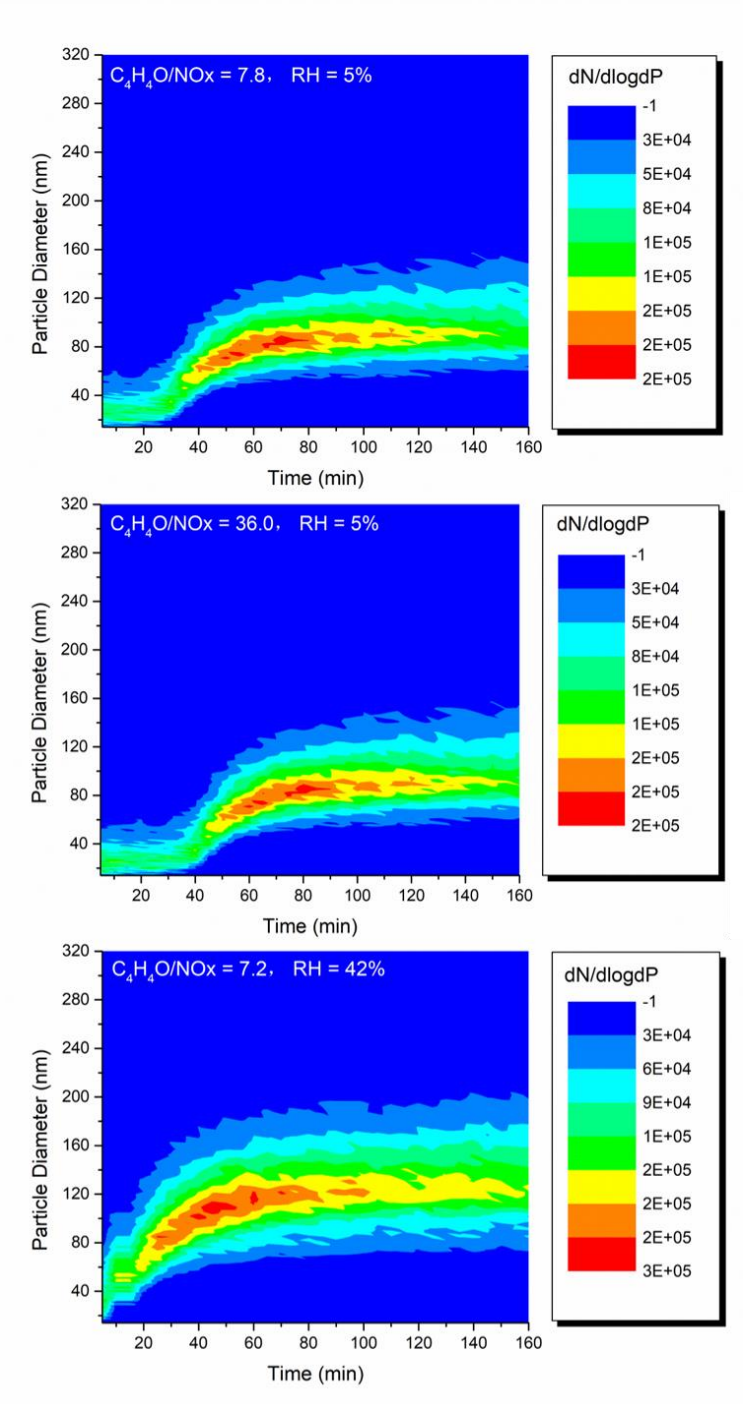

Figure S6: Contour plots of SOA bursts formed under different experimental conditions.

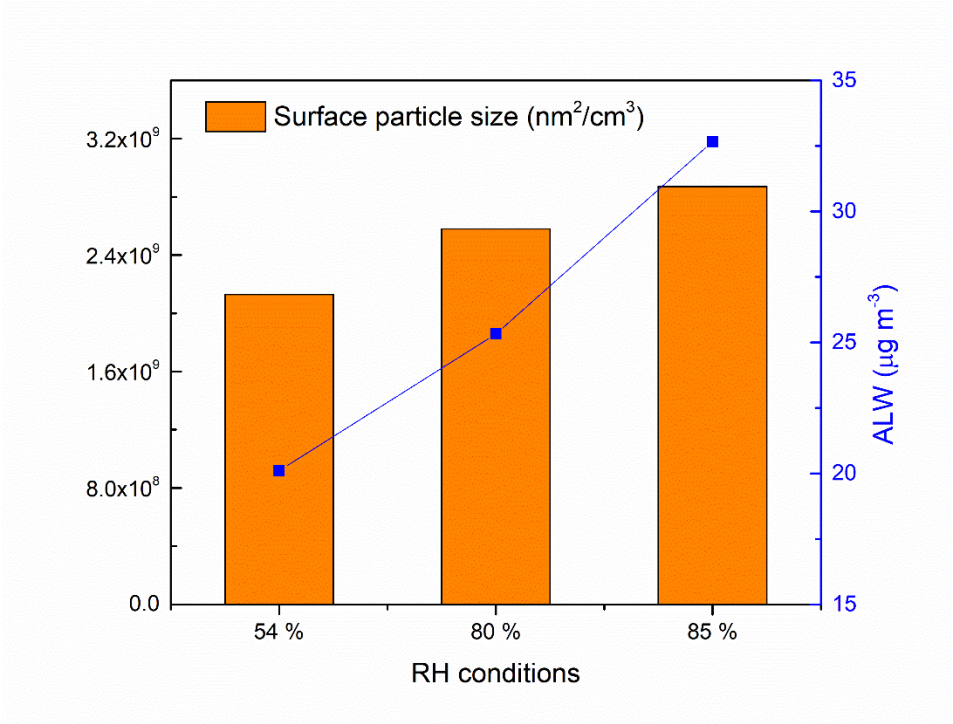

Figure S7: Variations of surface particle sizes and ALW under different experimental RH conditions.

Table S1. Summary of experimental conditions with the additional injection of H_2O_2 in the study of the NOx effect on SOA formaiton.

No.	$[furan]_0$ (ppb)	$[H_2O_2]_0$ (ppm)	$[NOx]_0$ (ppb)	RH (%)	C_4H_4O/NOx (ppbC/ppb)	SOA[e] ($\mu g\ m^{-3}$)	SOA yield (%)
13	802	1.7	15.3	< 10	52.4	30.1	3.7
14	811	1.6	40.2	< 10	20.2	76.3	9.4
15	807	1.7	87.5	< 10	9.2	169.2	20.9
16	797	1.7	200.1	< 10	4.0	216.9	27.2

Table S2. Summary of experimental conditions for HESI-Q Exactive-Orbitrap MS detection.

No.	$[furan]_0$ (ppb)	$[H_2O_2]_0$ (ppm)	$[NOx]_0$ (ppb)	RH (%)	C_4H_4O/NOx (ppbC/ppb)	Aim
17	723.5	3.5	26.4	<5	36.3	for HESI-Q Exactive-Orbitrap MS
18	748.3	6.5	152.6	<5	5.8	
19	764.8	7.2	163.5	30	5.9	
20	755.1	7.3	149.8	62	5.9	
21	736.7	5.6	150.3	88	5.8	

References

Atkinson, R., Aschmann, S. M., and Carter, W. P.: Kinetics of the reactions of O_3 and OH radicals with furan and thiophene at 298±2 K, Int. J. Chem. Kinet., 15, 51-61, 0.1002/kin.550150106, 1983.