Supporting Information of

Mass spectral characterization of secondary organic aerosol from urban lifestyle sources emissions

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Supplemental Information

This supplemental information includes 10 tables and 8 figures.

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Table S9. The θ angles among the mass spectra of cooking PMF_POA for different dishes.

Table S10. The θ angles among the mass spectra of vehicle PMF_LO-SOA at different conditions

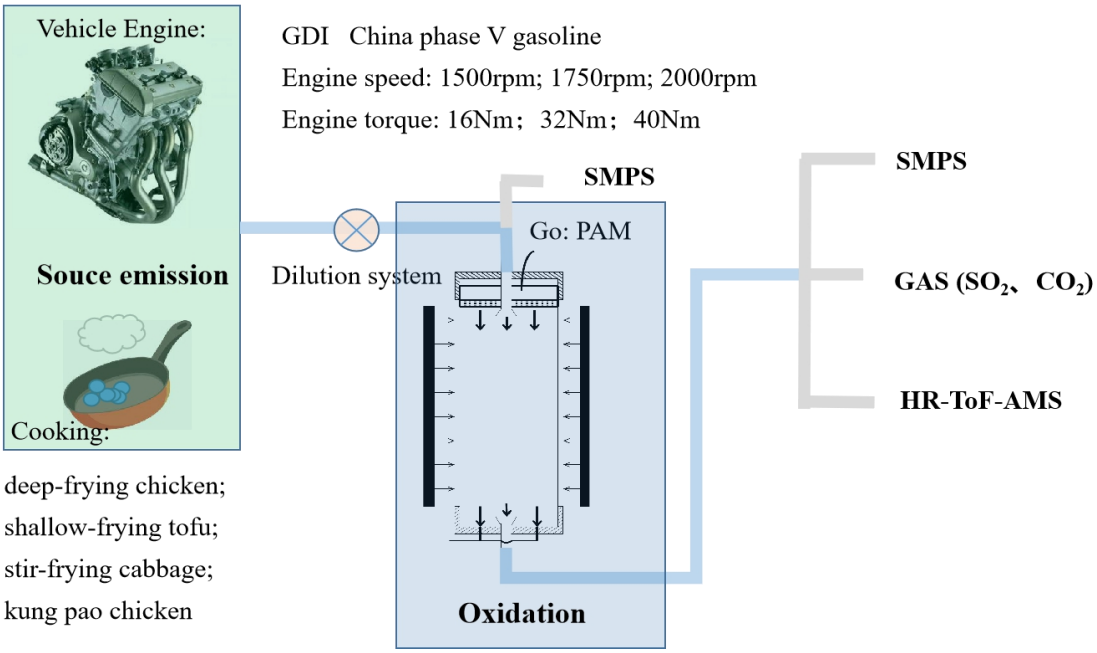
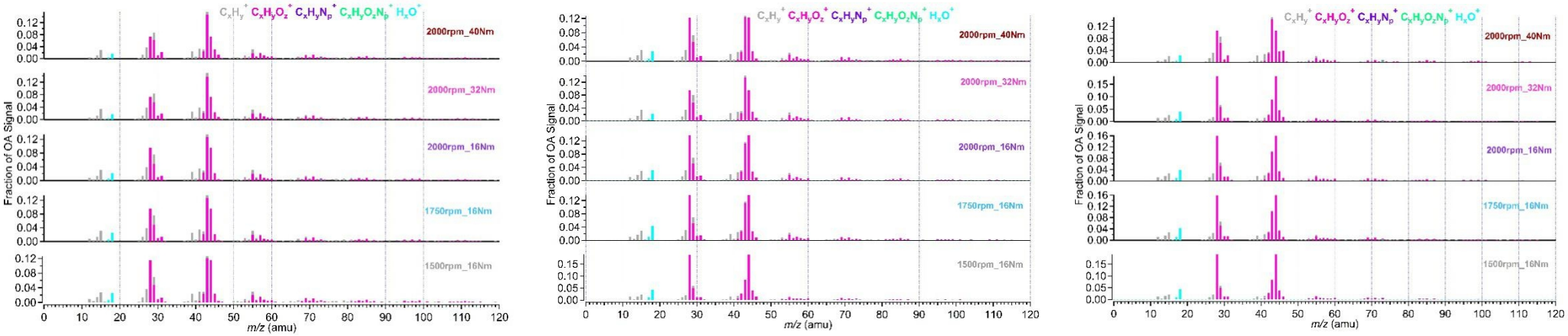


Fig.S1 Schematic depiction of the simulation and measurement system for the cooking and vehicle experiments.

Table S1. The OH exposure and photochemical age for all conditions in cooking and vehicle experiments

Cooking experiment				Vehicle experiment			
O_3 concentration (ppbv)	RH (%) & Temperature (℃)	OH exposure (molecules cm^{-3} s)	Photochemical Age (day)	O_3 concentration (ppbv)	RH (%) & Temperature (°)	OH exposure (molecules cm^{-3} s)	Photochemical Age (day)
0		0	0	0		0	0
310		4.3E+10	0.3	624		7.8E+10	0.6
1183	18~23%	9.6E+10	0.7	2367	44~49%	2.1E+11	1.7
2217	& 16~19℃	1.4E+11	1.1	4433	& 19~22℃	3.7E+11	2.9
4025		2.7E+11	2.1	6533		5.4E+11	4.2

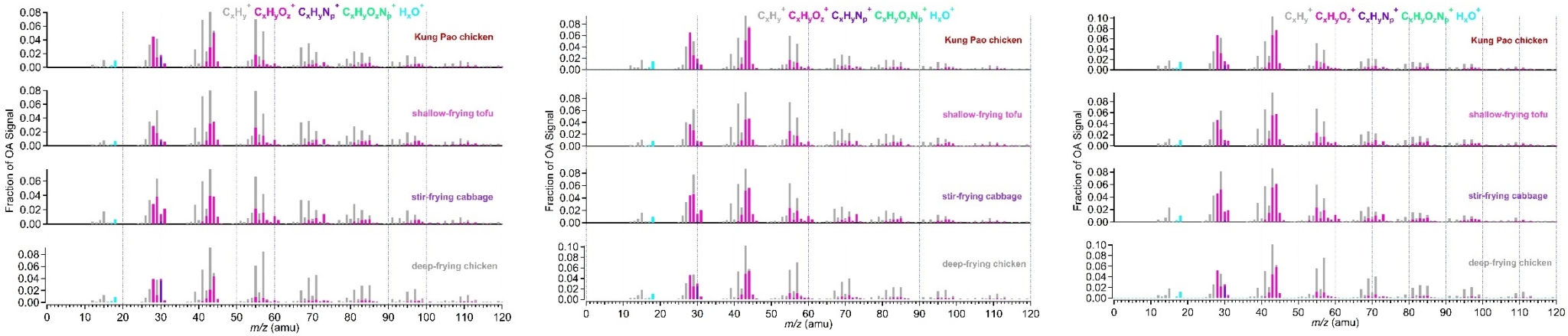


(a) EPA 1.65 days (b) EPA 2.89 days (c) EPA 4.15 days

Fig.S2. The mass spectra of aged HOA emission from different vehicle running conditions under different EPA.

Table S2. The θ angles among the mass spectra of aged HOA under EPA 1.7 days.

EPA1.7days / θ angles	1500rpm_16Nm	1750rpm_16Nm	2000rpm_16Nm	2000rpm_32Nm	2000rpm_40Nm
1500rpm_16Nm	**0**	**8**	**8**	**16**	**18**
1750 rpm_16 Nm		**0**	**1**	**9**	**11**
2000 rpm_16 Nm			**0**	**9**	**11**
2000 rpm_32 Nm				**0**	**4**
2000 rpm_42 Nm					**0**

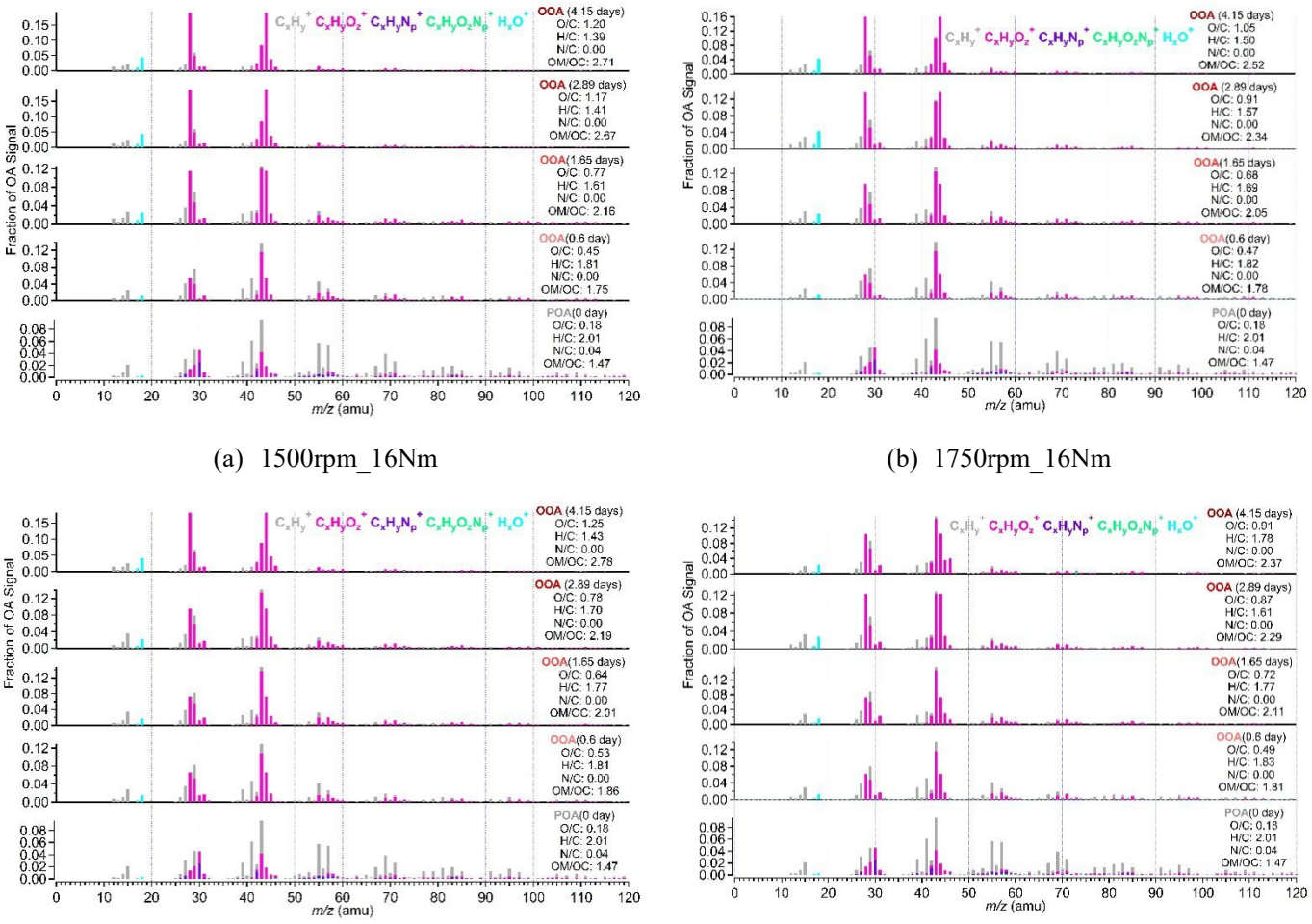


(d) EPA 0.3 day (e) EPA 1.1 days (f) EPA 2.1 days

Fig.S3. The mass spectra of aged COA emission from different Chinese dishes under different EPA.

Table S3. The θ angles among the mass spectra of aged COA under EPA 2.1 days.

EPA2.1days / θ angles	deep-frying chicken	stir-frying cabbage	shallow-frying tofu	Kung Pao chicken
deep-frying chicken	**0**	**22**	**18**	**17**
stir-frying cabbage		**0**	**10**	**13**
shallow-frying tofu			**0**	**12**
Kung Pao chicken				**0**



(a) 1500rpm_16Nm (b) 1750rpm_16Nm

(c) 2000rpm_32Nm (d) 2000rpm_40Nm

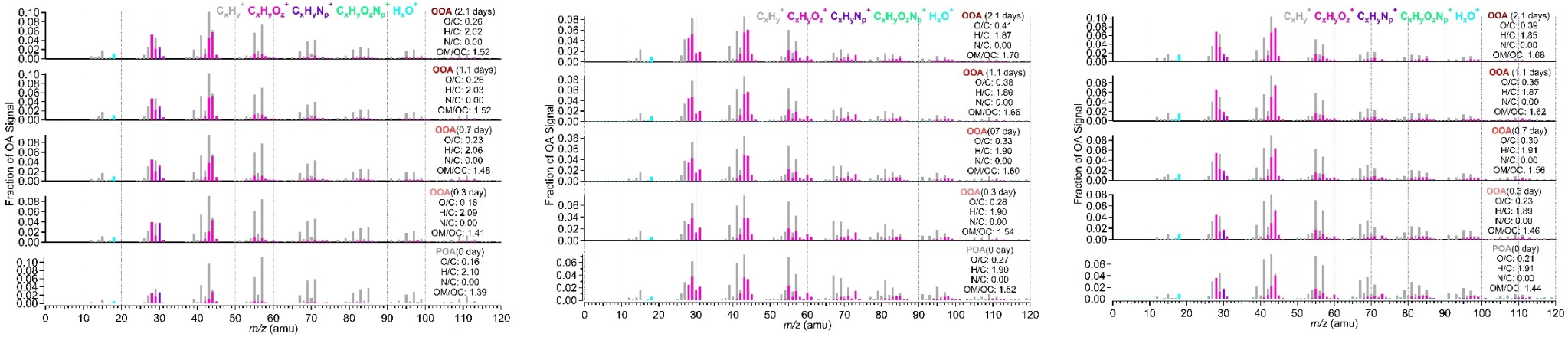
Fig.S4. The changes in mass spectra of aged HOA emissions from different conditions.

Table S4. The θ angles among the mass spectra under different EPA at one vehicle condition (2000rpm_16Nm).

2000rpm_16Nm / θ angles	POA	0.6 day	1.7 days	2.9 days	4.1 days
POA	0	29	40	51	57
0.6 day		0	15	29	36
1.7 days			0	15	22
2.9 days				0	7
4.1 days					0

Table S5. The θ angles among the mass spectra under different EPA at one vehicle condition (2000rpm_32Nm).

2000rpm_32Nm / θ angles	POA	0.6 day	1.7 days	2.9 days	4.1 days
POA	0	30	35	41	62
0.6 day		0	7	13	38
1.7 days			0	10	37
2.9 days				0	28
4.1 days					0



(a) Deep-frying chicken (b) Stir-frying cabbage (c) Kung Pao chicken

Fig.S5. The mass spectra of aged COA oxidation under different OH exposure for different Chinese dishes.

Table S6. The θ angles among the mass spectra under different EPA for shallow frying.

Shallow frying	POA	0.3 day	0.7 day	1.1 days	2.1 days
POA	0	7	12	15	21
0.3 day		0	6	9	14
0.7 day			0	3	9
1.1 days				0	6
2.1 days					0

Table S7. The θ angles among the mass spectra under different EPA for kung pao chicken.

Kung Pao chicken	POA	0.3 day	0.7 day	1.1 days	2.1 days
POA	0	7	13	19	23
0.3 day		0	8	13	17
0.7 day			0	7	10
1.1 days				0	7
2.1 days					0

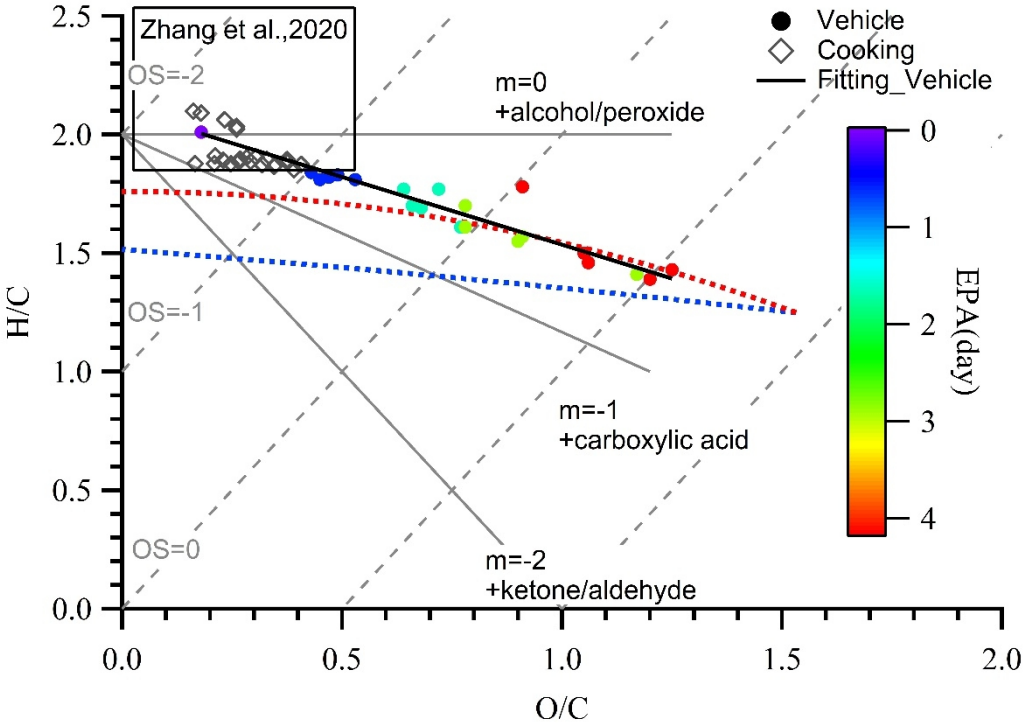


Fig.S6. Van Krevelen diagram of POA, aged COA and aged HOA from vehicle and cooking.

Table S8. The θ angles among the mass spectra of cooking PMF_SOA for different dishes.

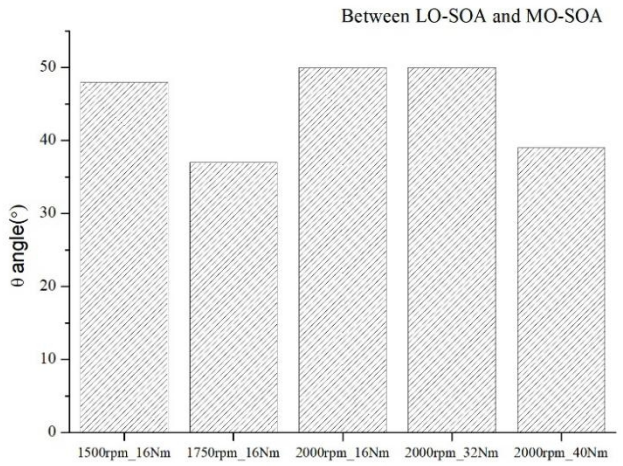
cooking_SOA / θ angles	deep-frying chicken	stir-frying cabbage	shallow-frying tofu	Kung Pao chicken
deep-frying chicken	**0**	**21**	**18**	**19**
stir-frying cabbage		**0**	**8**	**13**
shallow-frying tofu			**0**	**13**
Kung Pao chicken				**0**

Table S9. The θ angles among the mass spectra of cooking PMF_POA for different dishes.

cooking_POA / θ angles	deep-frying chicken	stir-frying cabbage	shallow-frying tofu	Kung Pao chicken
deep-frying chicken	**0**	**31**	**28**	**20**
stir-frying cabbage		**0**	**13**	**17**
shallow-frying tofu			**0**	**10**
Kung Pao chicken				**0**

Table S10. The θ angles among the mass spectra of vehicle PMF_LO-SOA at different conditions.

Vehicle_LO-SOA / θ angles	1500rpm_16Nm	1750rpm_16Nm	2000rpm_16Nm	2000rpm_32Nm
1500rpm_16Nm	**0**	**3**	**3**	**6**
1750 rpm_16 Nm		**0**	**3**	**7**
2000 rpm_16 Nm			**0**	**6**
2000 rpm_32 Nm				**0**
2000 rpm_42 Nm				



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94 Fig.S7. The θ angles between vehicle LO-SOA and MO-SOA under five running conditions.

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Table S11. The θ angles between ambient COA, HOA, LO-OOA and MO-OOA factors and the cooking PMF POA, SOA, and the vehicle PMF LO-SOA, MO-SOA.

θ angles	HOA_ambient	COA_ambient	LO-OOA_ambient	MO-OOA_ambient	Cooking_POA	Cooking_SOA	Vehicle_LO-SOA	Vehicle_MO-SOA
HOA_ambient	**0**	21	36	56	21	27	30	61
COA_ambient	21	**0**	31	49	18	22	34	55
LO-OOA_ambient	36	31	**0**	37	18	28	32	52
MO-OOA_ambient	56	49	37	**0**	18	28	33	18
Cooking_POA	21	18	18	18	**0**	31	39	64
Cooking_SOA	27	22	28	28	31	**0**	19	46
Vehicle_LO-SOA	30	34	32	33	39	19	**0**	46
Vehicle_MO-SOA	61	55	52	18	64	46	46	**0**

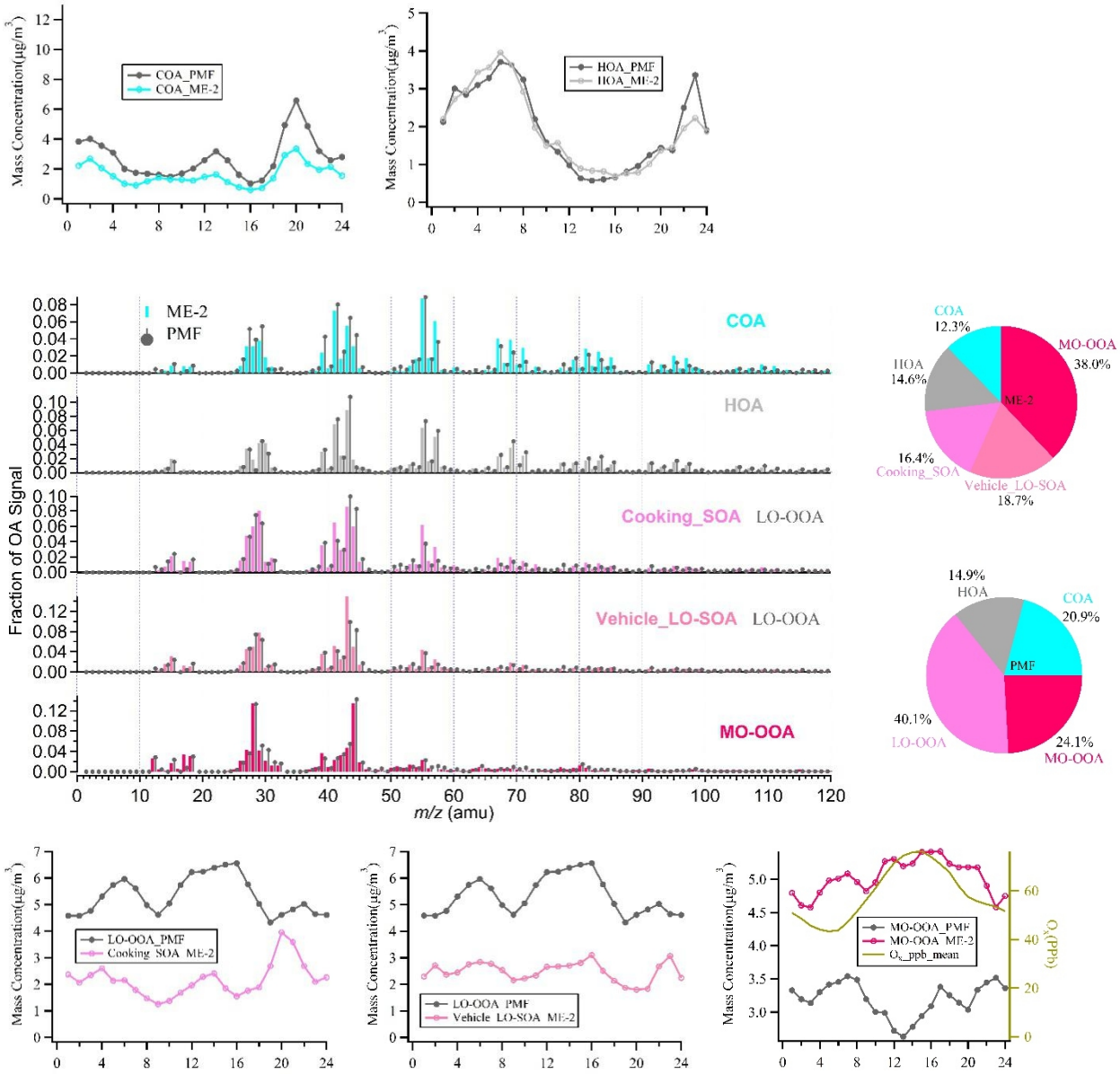

Fig.S8. The comparison of the mass spectra, the diurnal variation, and fraction between ME-2 and PMF resolved factors during the summertime in Shanghai.