atmosphere

Supplementary Materials:

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Table S1. Detailed description of the sampling time.

Season	month	Start time	Stop time	sampling time
Monsoon	August	2014/08/10 12noon	2014/08/17 12noon	3 days
		2014/08/17 12noon	2014/08/24 12noon	3 days
		2014/08/24 12noon	2014/08/31 12noon	3days
	September	2014/08/31 12noon	2014/09/07 12noon	3 days
		2014/09/07 12noon	2014/09/14 12noon	3 days
		2014/09/14 12noon	2014/09/21 12noon	3 days
		2014/09/21 12noon	2014/09/28 12noon	3 days
Non-monsoon	November	2014/11/17 12noon	2014/11/23 12noon	6 days
		2014/11/23 12noon	2014/11/30 12noon	7 days
		2014/11/30 12noon	2014/12/07 12noon	7 days
	December	2014/12/07 12noon	2014/12/14 12noon	7 days
		2014/12/14 12noon	2014/12/20 12noon	6 days
		2014/12/20 12noon	2014/12/27 12noon	7 days
		2014/12/27 12noon	2015/01/03 12noon	7 days

Table S2. Mass concentrations (μg m^{-3}) of size-segregated atmospheric particulate matter (PM) samples during the monsoon, non-monsoon, and whole sampling period.

Season	$PM_{<0.49}$	$PM_{0.49–0.95}$	$PM_{0.95–1.5}$	$PM_{1.5–3.0}$	$PM_{3.0–7.2}$	$PM_{>7.2}$
Monsoon	19.18 ± 6.65	2.18 ± 0.85	2.52 ± 0.97	2.78 ± 1.10	5.67 ± 2.08	7.03 ± 2.17
Non-monsoon	32.02 ± 11.48	2.57 ± 0.71	2.40 ± 0.60	6.98 ± 4.13	9.54 ± 6.13	14.02 ± 8.62
Average	25.60 ± 11.21	2.37 ± 0.78	2.46 ± 0.78	4.88 ± 3.63	7.60 ± 4.83	10.52 ± 7.04

Table S3. organic carbon (OC), elemental carbon (EC), and water-soluble organic carbon (WSOC) concentrations of size-segregated aerosols (The unit is in μg/m^3).

	Season	$PM_{<0.49}$	$PM_{0.49–0.95}$	$PM_{0.95–1.5}$	$PM_{1.5–3.0}$	$PM_{3.0–7.2}$	$PM_{>7.2}$
OC	Monsoon	2.32 ± 0.67	0.91 ± 0.33	0.47 ± 0.16	0.66 ± 0.40	1.01 ± 0.42	1.14 ± 0.59
	Non-monsoon	3.20 ± 1.54	0.54 ± 0.26	0.34 ± 0.12	3.44 ± 2.43	1.32 ± 0.88	1.72 ± 1.00
EC	Monsoon	0.57 ± 0.21	0.09 ± 0.05	0.11 ± 0.06	0.07 ± 0.04	0.06 ± 0.05	0.04 ± 0.02
	Non-monsoon	1.11 ± 0.88	0.06 ± 0.04	0.04 ± 0.02	0.15 ± 0.10	0.10 ± 0.15	0.07 ± 0.04
WSOC	Monsoon	1.72 ± 0.67	0.52 ± 0.28	0.22 ± 0.07	0.29 ± 0.15	0.65 ± 0.32	0.85 ± 0.51
	Non-monsoon	1.01 ± 0.18	0.29 ± 0.18	0.19 ± 0.09	1.25 ± 0.91	0.90 ± 0.57	1.33 ± 0.97

Table S4. The OC/EC ratios of size-segregated particles during the monsoon, non-monsoon, and whole sampling period.

		$PM_{<0.49}$	**$PM_{0.49–0.95}$**	**$PM_{0.95–1.5}$**	**$PM_{1.5–3.0}$**	**$PM_{3.0–7.2}$**	**$PM_{>7.2}$**	**PM_{3}**	**PM_{10}**
OC	Monsoon	2.32 ± 0.67	0.91 ± 0.33	0.47 ± 0.16	0.66 ± 0.40	1.01 ± 0.42	1.14 ± 0.59	4.36 ± 1.11	6.50 ± 2.00
	Non-monsoon	3.20 ± 1.54	0.54 ± 0.26	0.34 ± 0.12	3.44 ± 2.43	1.32 ± 0.88	1.72 ± 1.00	7.53 ± 3.27	10.56 ± 5.08
EC	Monsoon	0.57 ± 0.21	0.09 ± 0.05	0.11 ± 0.06	0.07 ± 0.04	0.06 ± 0.05	0.04 ± 0.02	0.83 ± 0.27	0.94 ± 0.33
	Non-monsoon	1.11 ± 0.88	0.06 ± 0.04	0.04 ± 0.02	0.15 ± 0.10	0.10 ± 0.15	0.07 ± 0.04	1.35 ± 0.84	1.49 ± 0.83
WSOC	Monsoon	1.72 ± 0.67	0.52 ± 0.28	0.22 ± 0.07	0.29 ± 0.15	0.65 ± 0.32	0.85 ± 0.51	2.76 ± 0.77	4.26 ± 1.46
	Non-monsoon	1.01 ± 0.18	0.29 ± 0.18	0.19 ± 0.09	1.25 ± 0.91	0.90 ± 0.57	1.33 ± 0.97	3.39 ± 1.13	5.62 ± 2.86

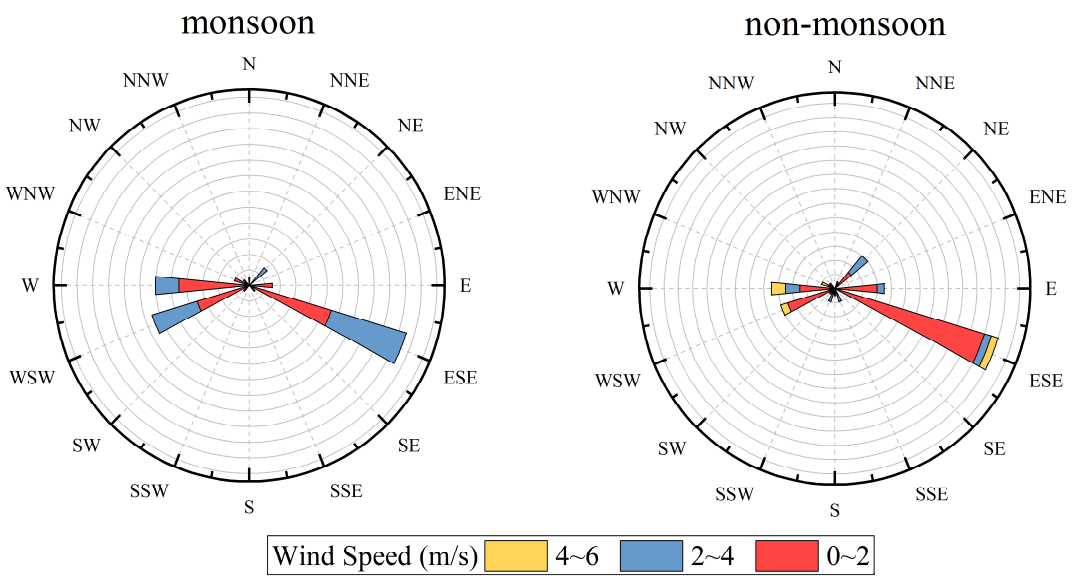

Figure S1. Wind speed in Lhasa during the monsoon and non-monsoon seasons.

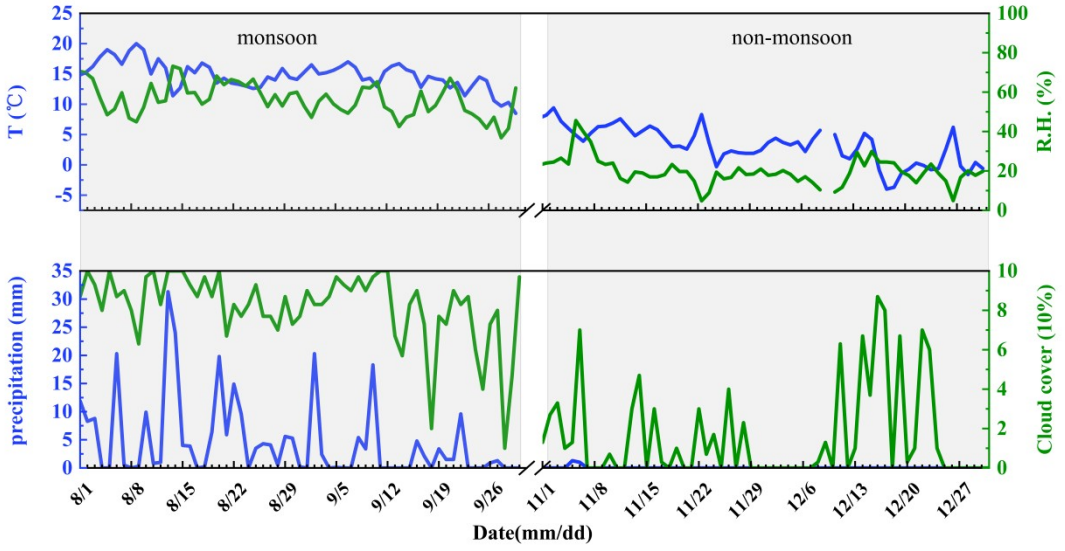

Figure S2. Behavior of temperature, relative humidity, precipitation and cloud cover in Lhasa during the sampling period.

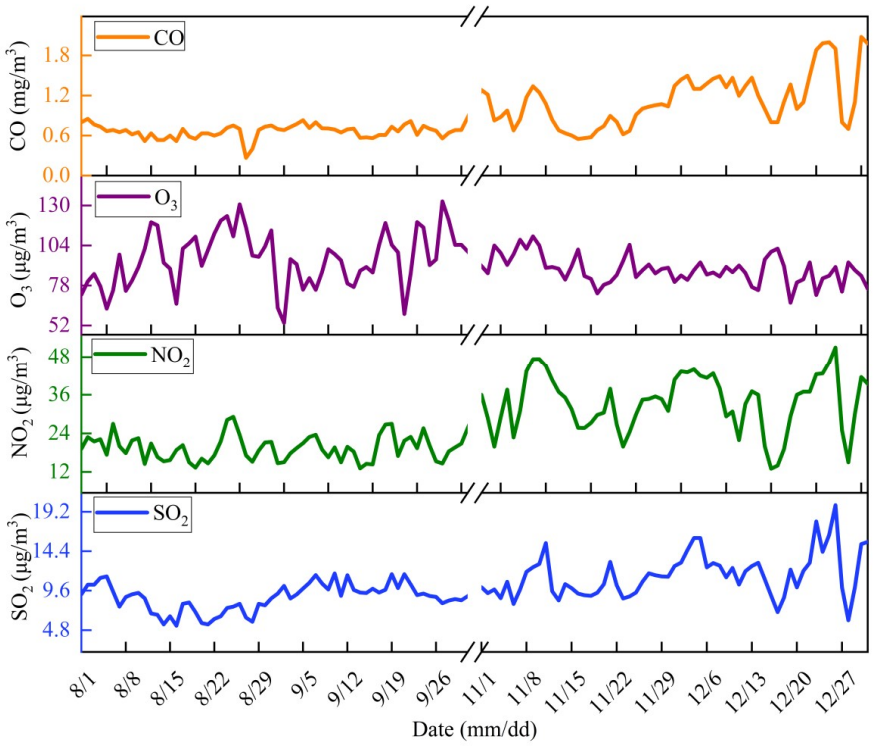

Figure S3. Behavior of CO, O_3, NO_2, and SO_2 in Lhasa during the sampling period.

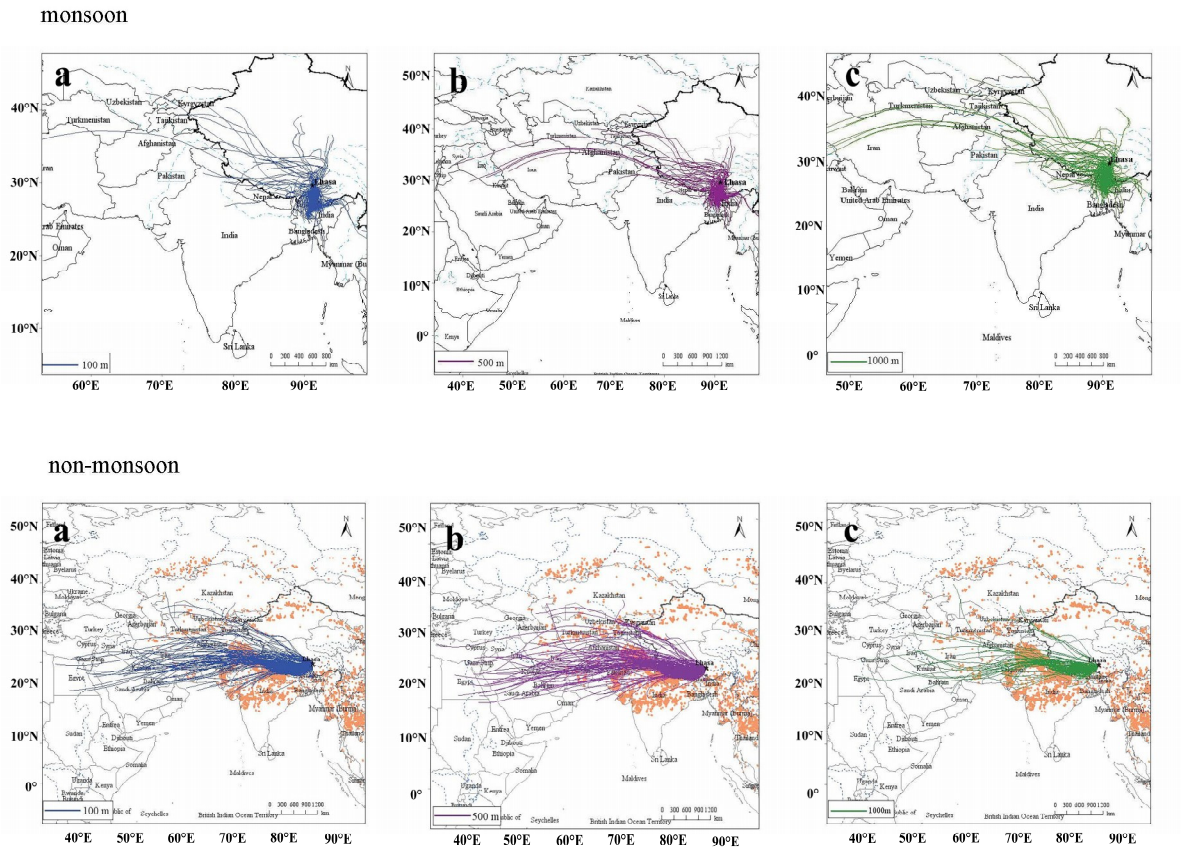

Figure S4. All backward trajectories of different heights during the monsoon and non-monsoon seasons, 4 tracks per day, starting from 00:00, 06:00, 12:00, 18:00.

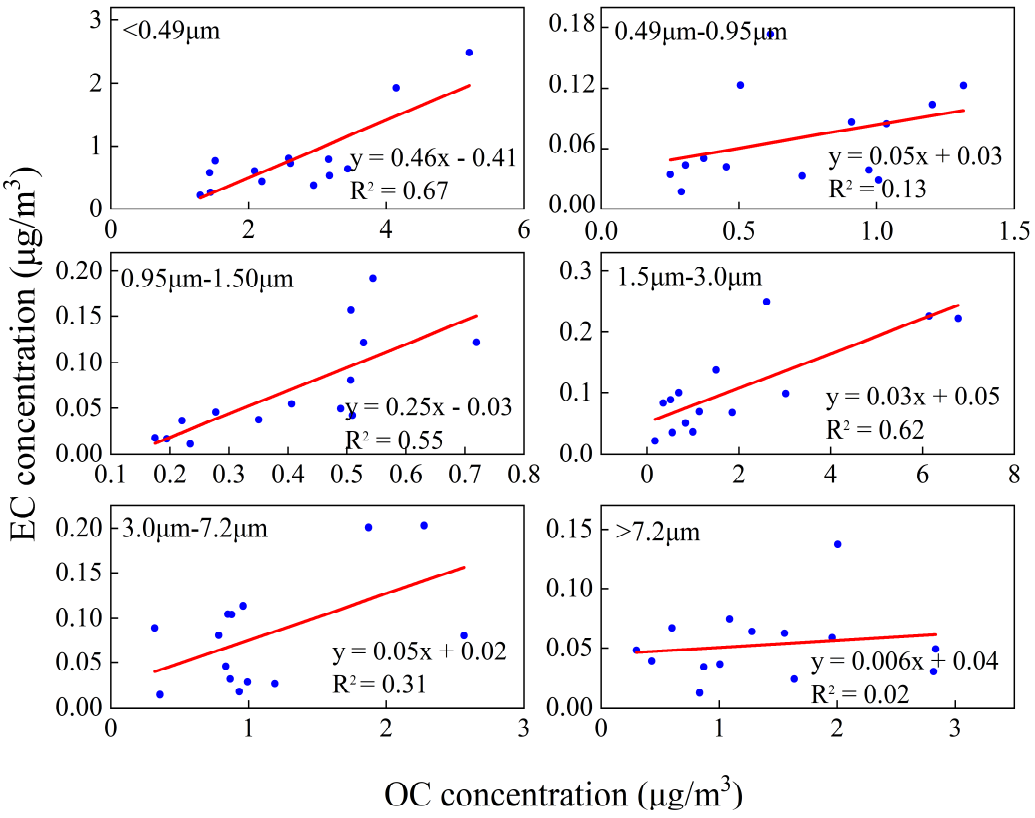

Figure S5. The correlation between the OC and EC in different size particles.

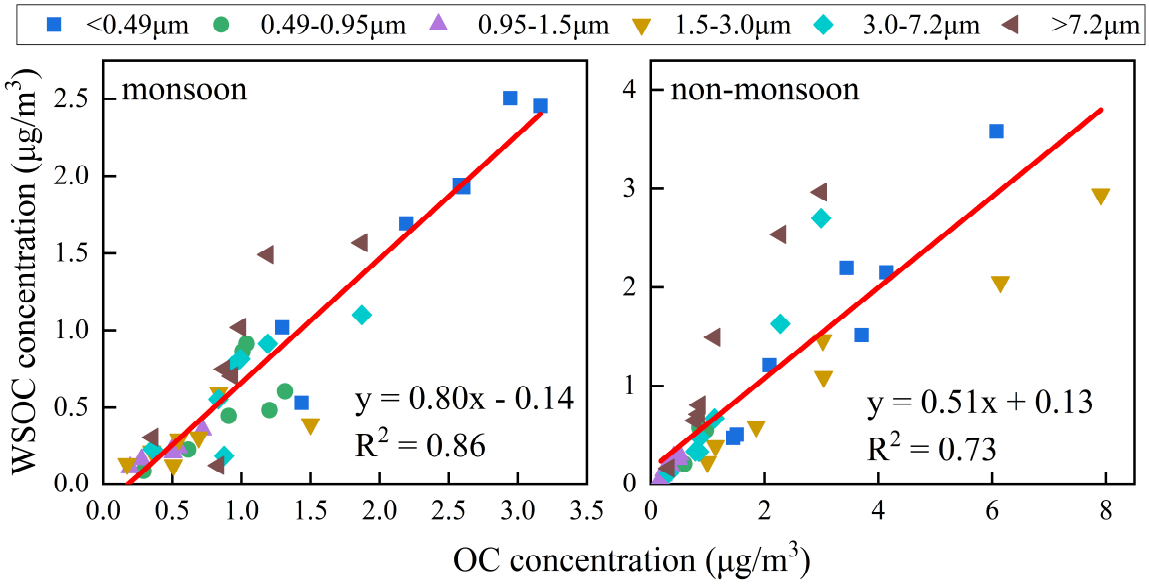

Figure S6. Correlation between the OC and WSOC mass concentration with all size particles during the monsoon and non-monsoon seasons.

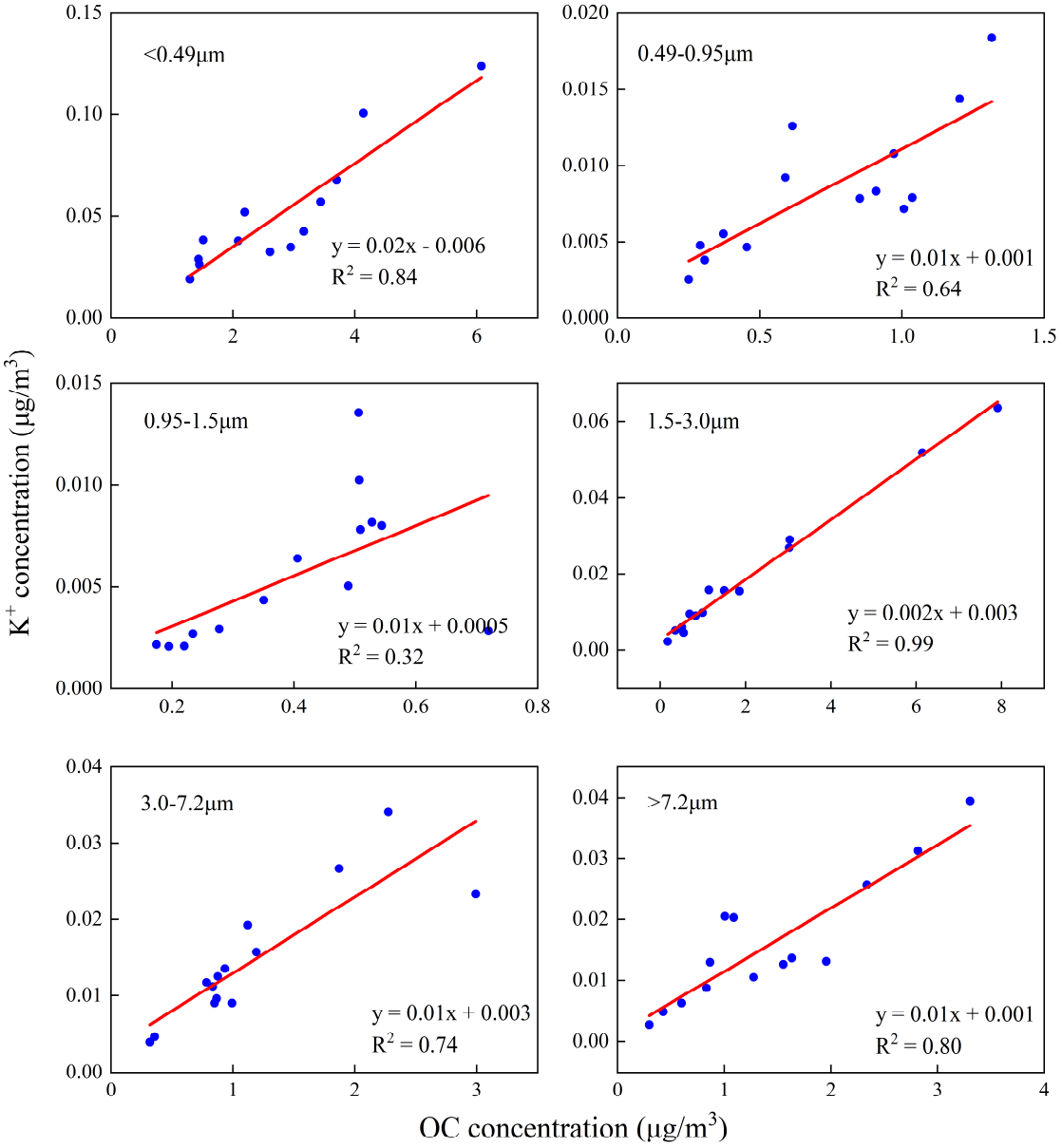

Figure S7. Correlation between the OC and K^+ mass concentration in different size particles.

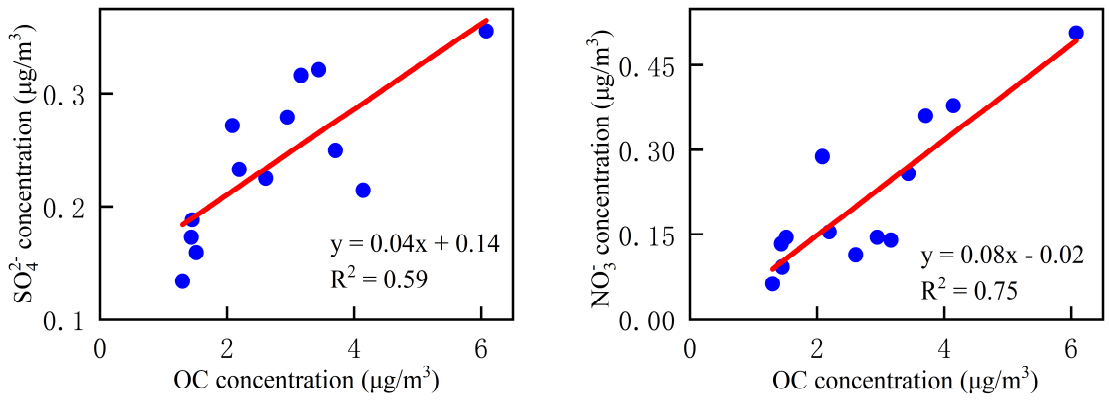

Figure S8. Correlation between the OC and SO_4^{2-} (NO_3^-) mass concentration at <0.49 μm.

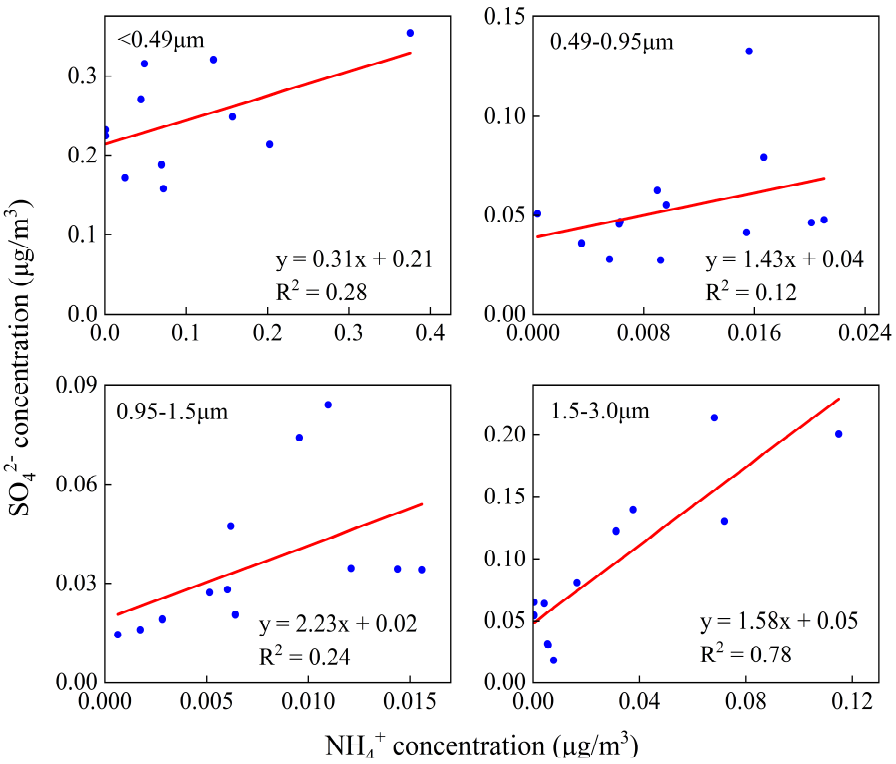

Figure S9. Correlation of the NH_4^+ and SO_4^{2-} mass concentration in fine mode particles.

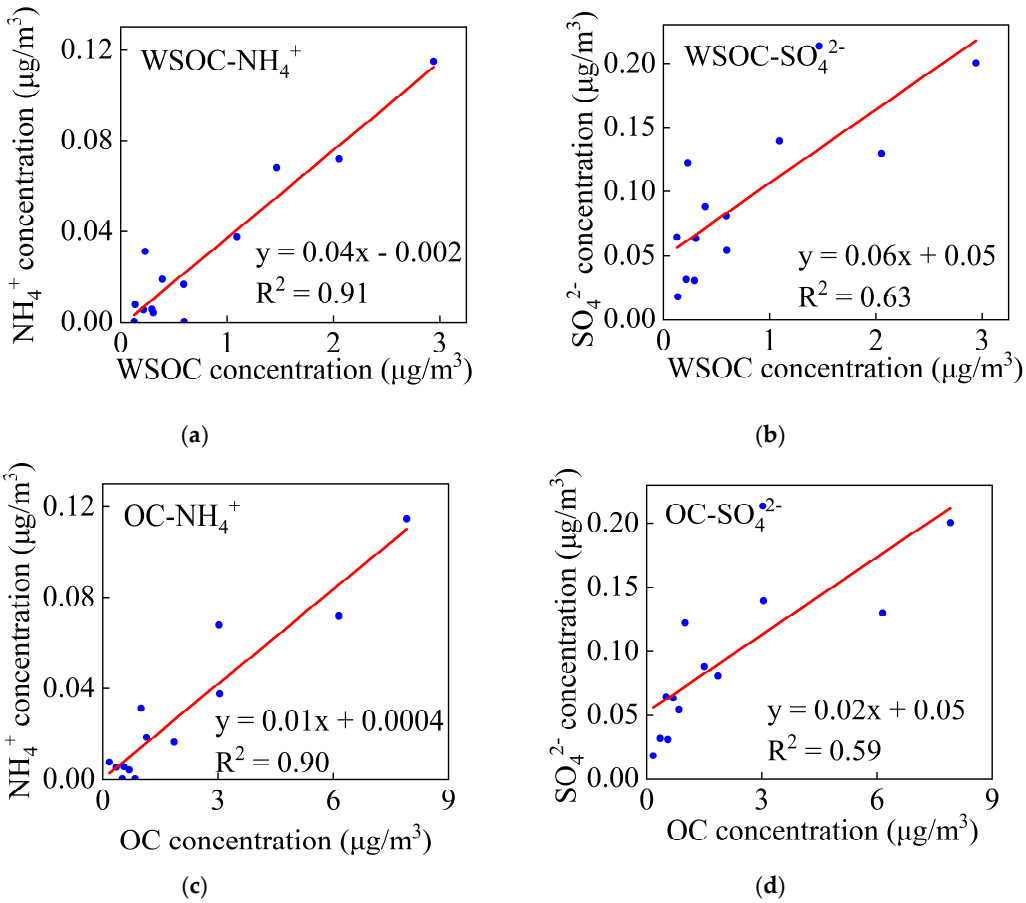

Figure S10. (**a**) Correlation of the NH_4^+ and WSOC mass concentration at 1.5–3.0 μm; (**b**) Correlation of the SO_4^{2-} and WSOC mass concentration at 1.5–3.0 μm; (**c**) Correlation of the NH_4^+ and OC mass concentration at 1.5–3.0 μm; (**d**) Correlation of the SO_4^{2-} and OC mass concentration at 1.5–3.0 μm.

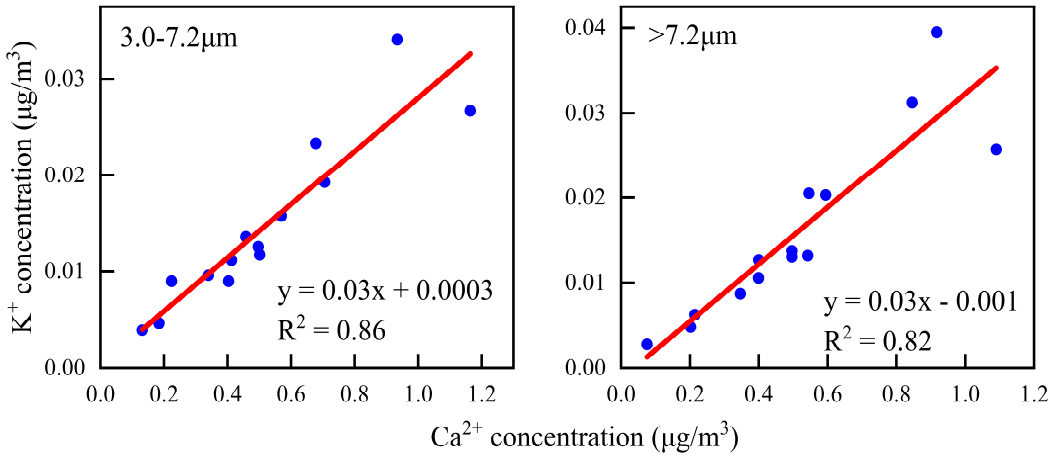

Figure S11. Correlation between the Ca^{2+} and K^+ mass concentration in the coarse mode.