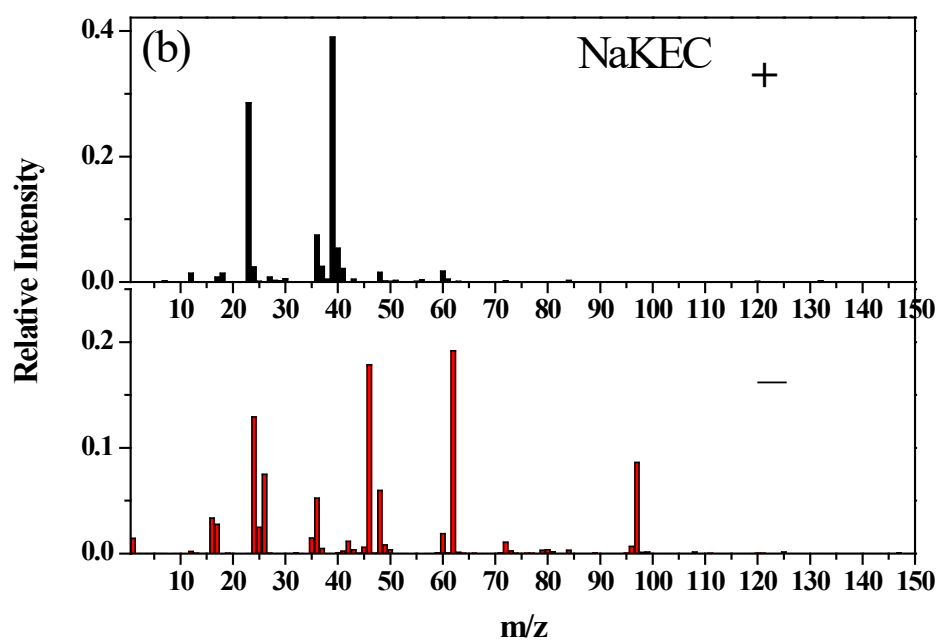
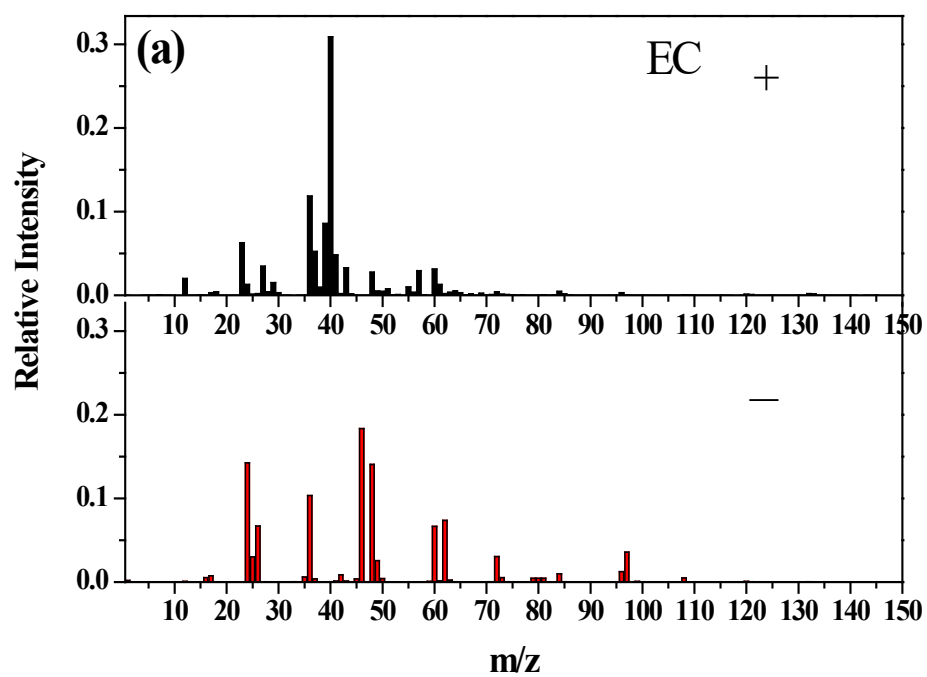
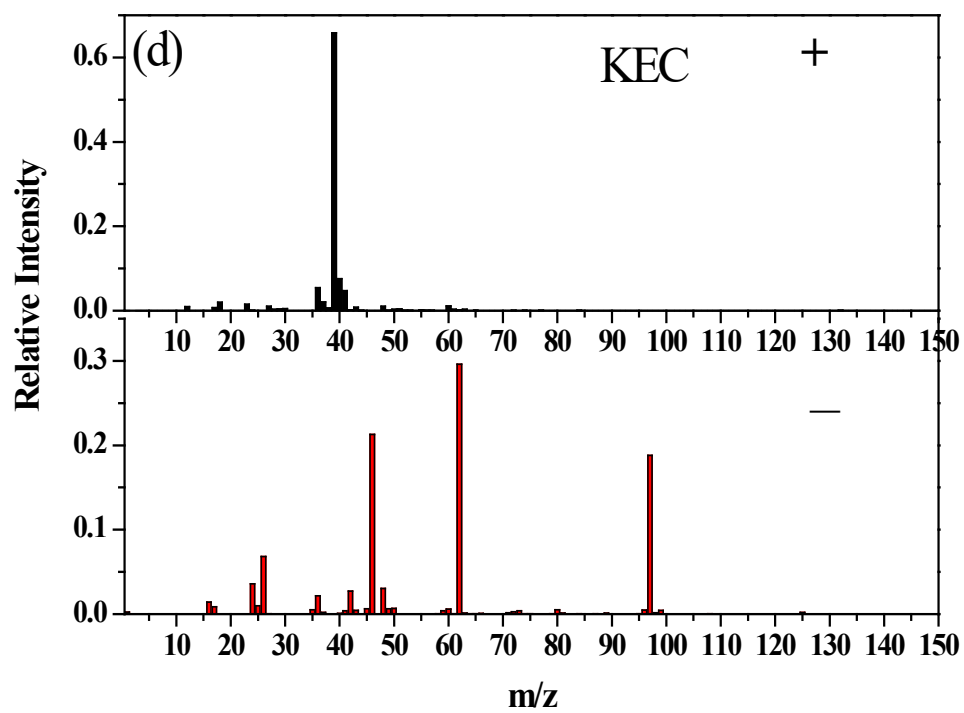
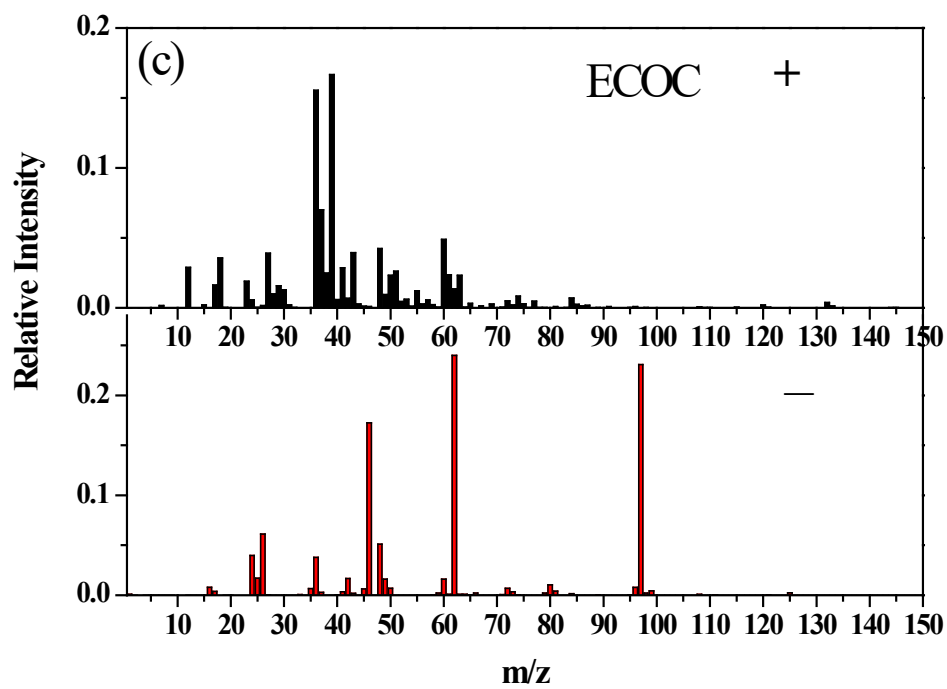
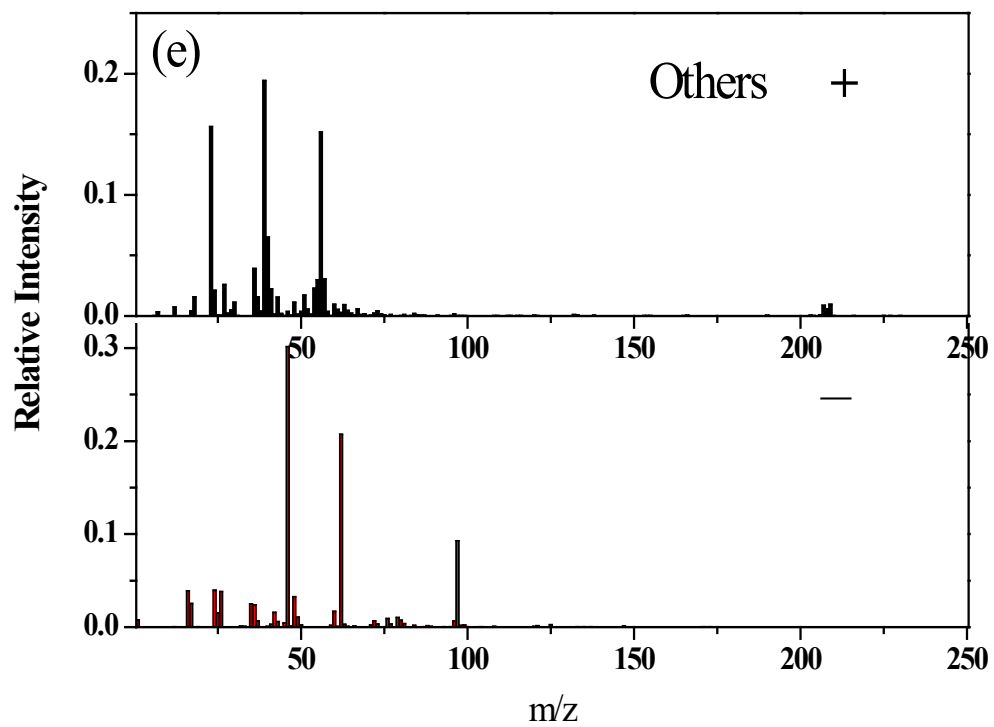


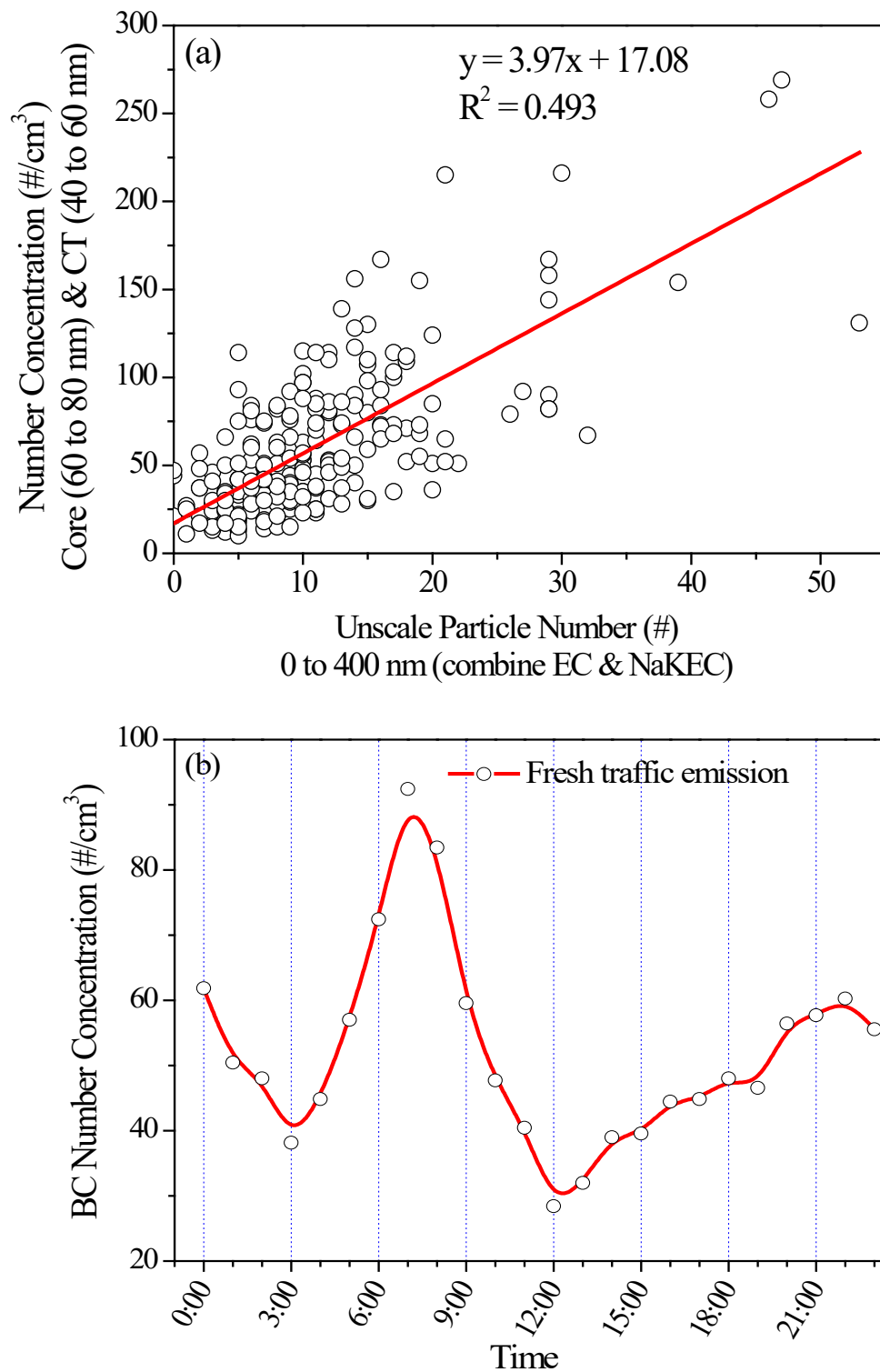
## Supplementary Material



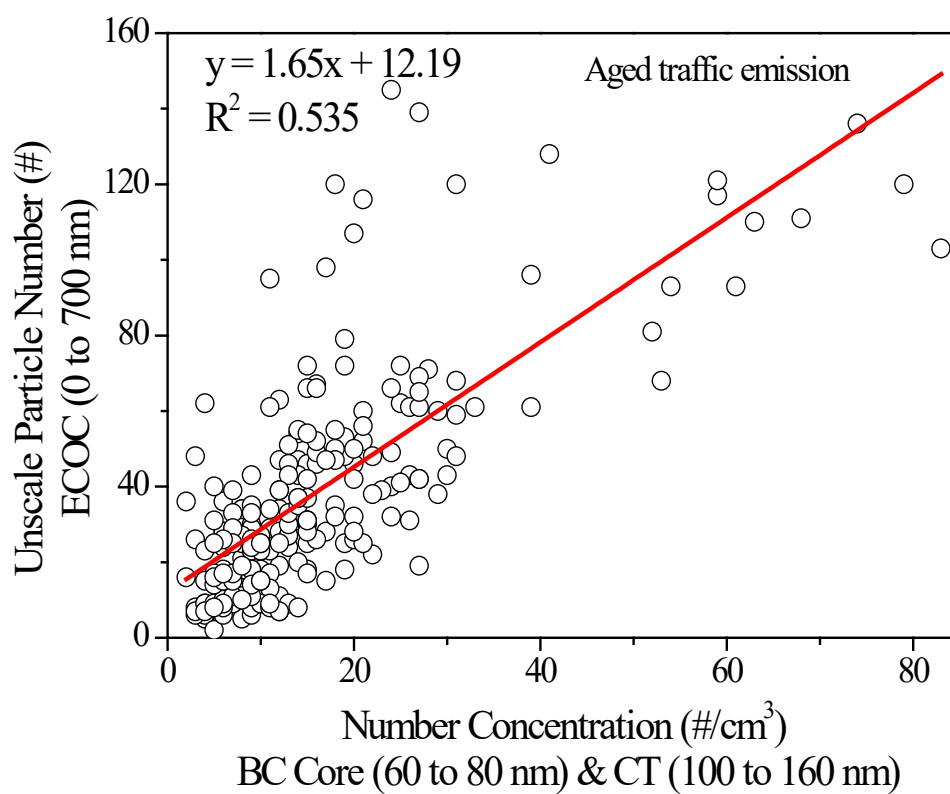




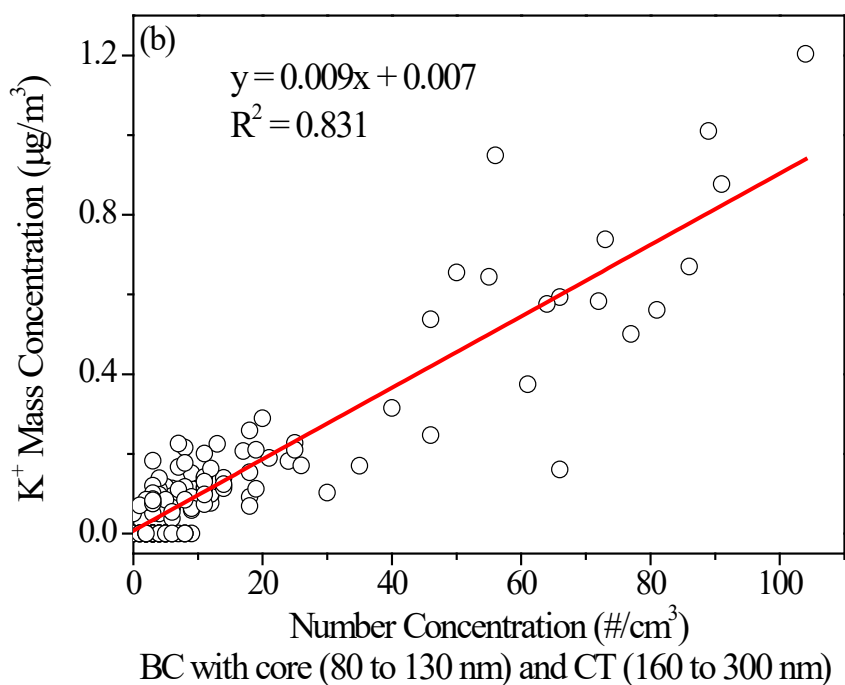
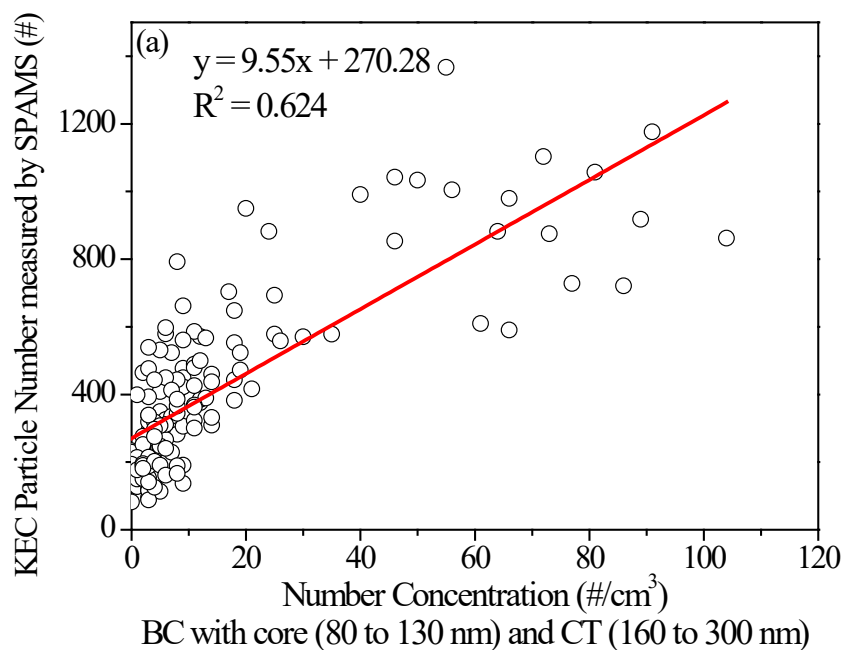
**Fig. S1.** Averaged mass spectra of different types of BC-containing particles. (a) EC; (b) NaKEC; (c) ECOC; (d) KEC; (e) Others.



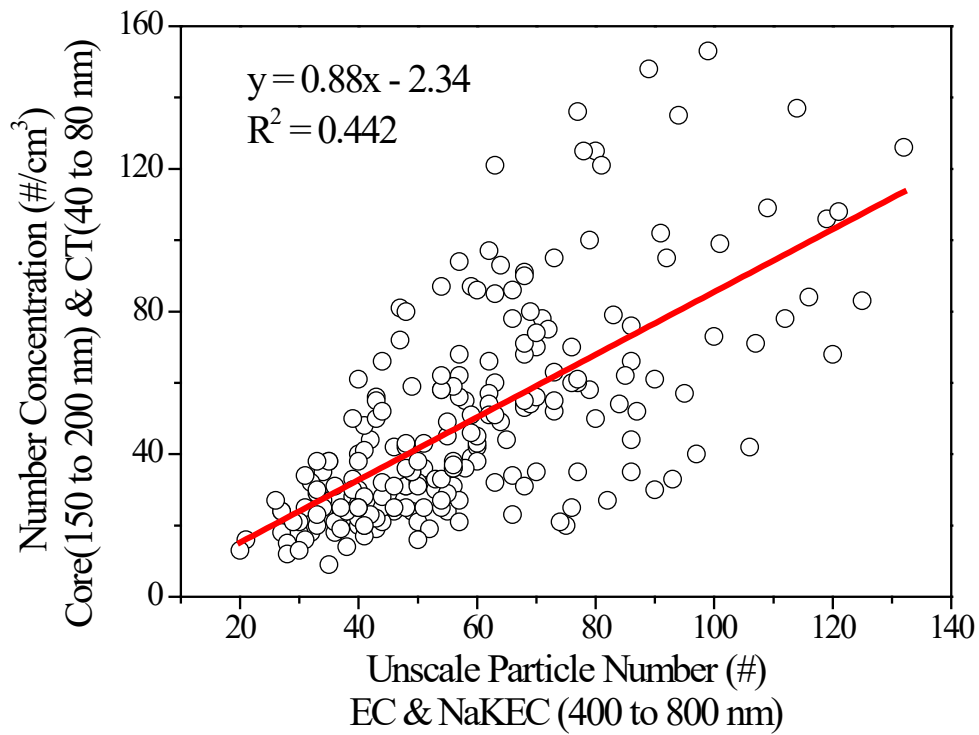
**Fig. S2.** (a) Correlation between EC & NaKEC (0 to 400 nm) measured by SPAMS and BC particles with core size (60 to 80 nm) and CT (40 to 60 nm); (b) The diurnal variation of BC particles with core (60 to 80 nm) and CT (40 to 60 nm).



**Fig. S3.** Correlation between ECOC (0 to 700 nm) measured by SPAMS and BC particles with core size (60 to 80 nm) and CT (100 to 160 nm).



**Fig. S4.** (a) Correlation between KEC (0 to 1200 nm) particle number measured by SPAMS and BC particles with core size (80 to 130 nm) and CT (160 to 300 nm); (b) Correlation between  $K^+$  mass concentration measured by MARGA and number concentration of BC particles with core size (80 to 130 nm) and CT (160 to 300 nm).



**Fig. S5.** Correlation between EC & NaKEC (400 to 800 nm) particle number measured by SPAMS and the number concentration of BC particles with core size (150 to 200 nm) and CT (40 to 80 nm).