Supplementary Material

Characterization of Organic Aerosol Produced during Pulverized Coal Combustion in a Drop Tube Furnace

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Submitted to

Atmospheric Chemistry and Physics

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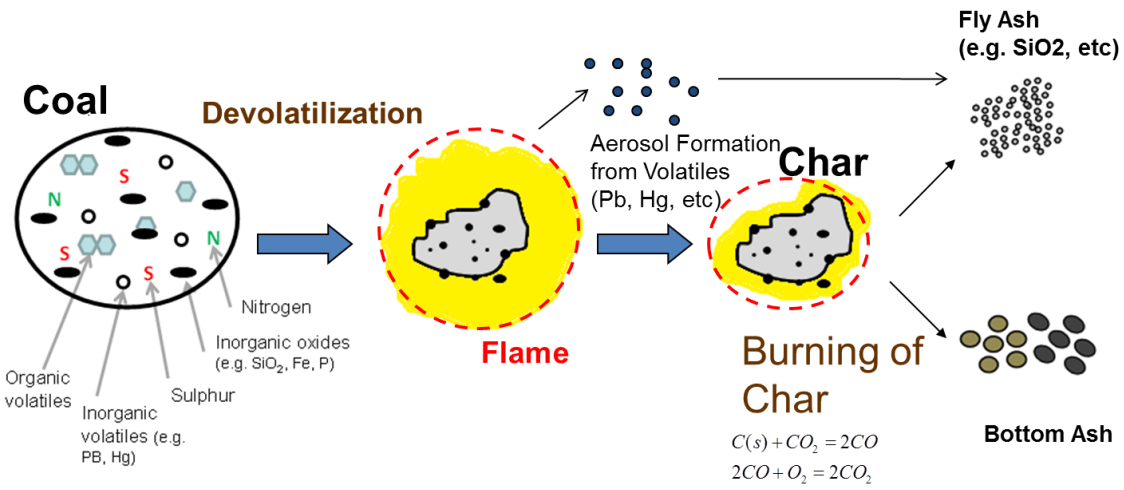
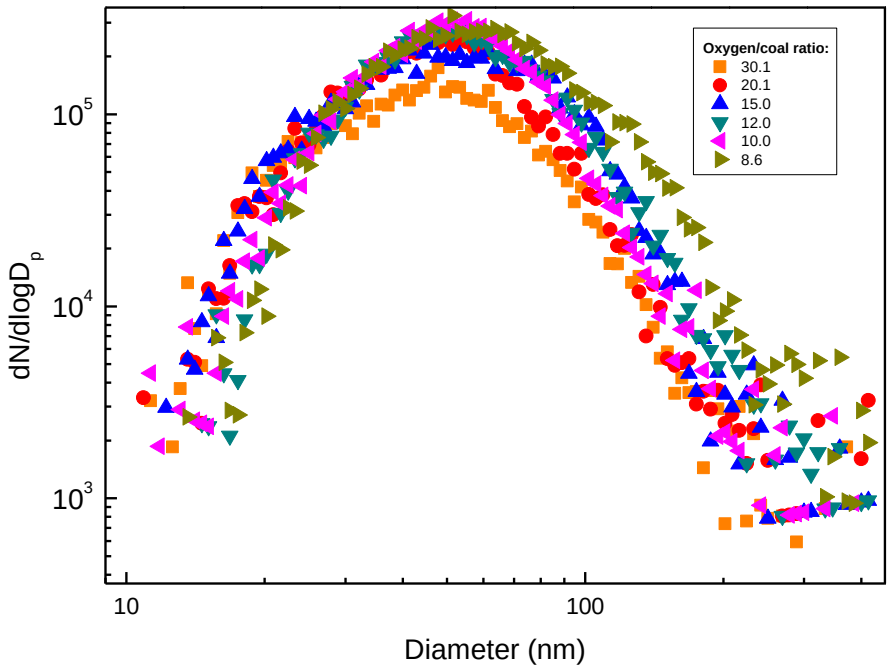


Figure S1. Schematic diagram of combustion process of a single coal particle



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2 Figure S2. Size distribution (from SMPS) of particles from coal combustion under various

3 oxygen/coal ratios

4

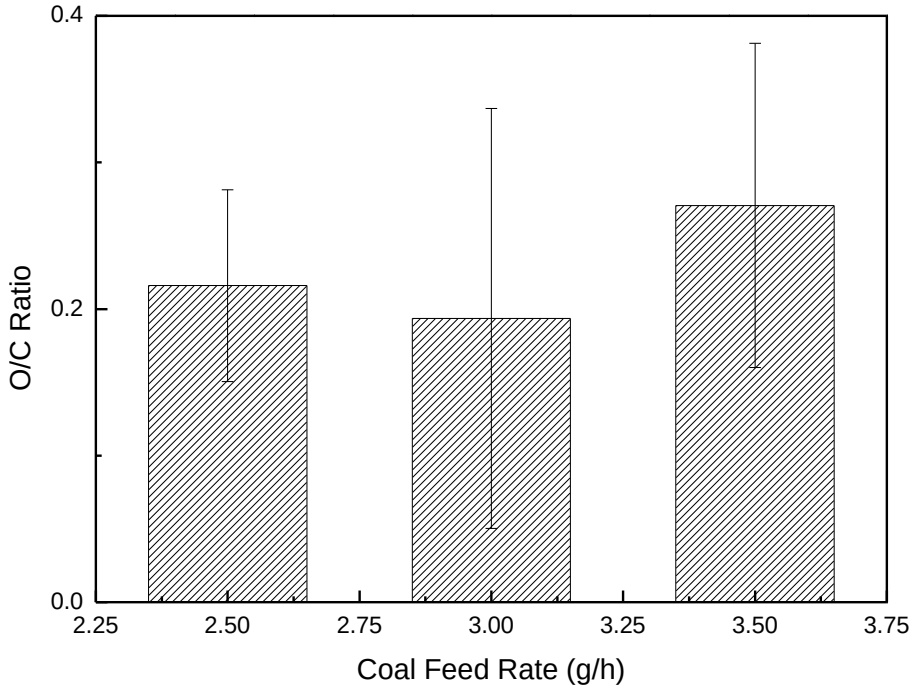
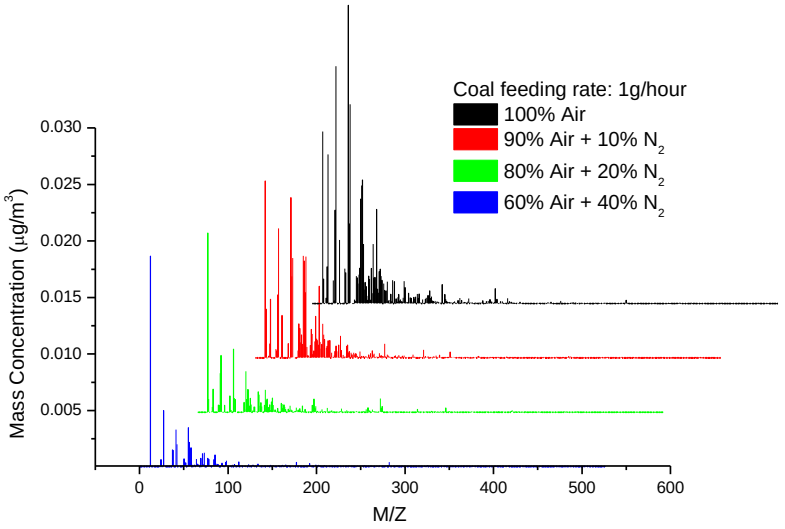


Figure S3. O/C elemental ratios for particulate organic matter from coal combustion at larger coal feed rates (the MS signal is too low to calculate O/C ratio for coal feed rate at 1, 1.5 and 2 g/hr)

A.



B.

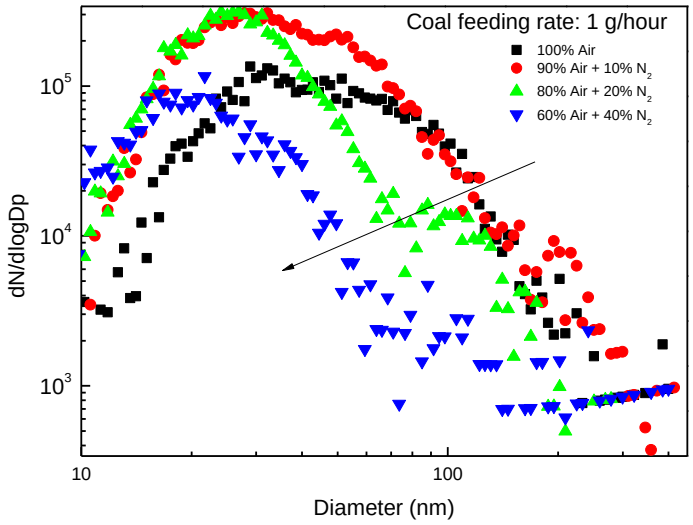


Figure S4. **(A)** Average AMS organic mass spectra and **(B)** size distributions (from SMPS) for different air/nitrogen ratios at a lower coal feed rate (1.0 g/h)

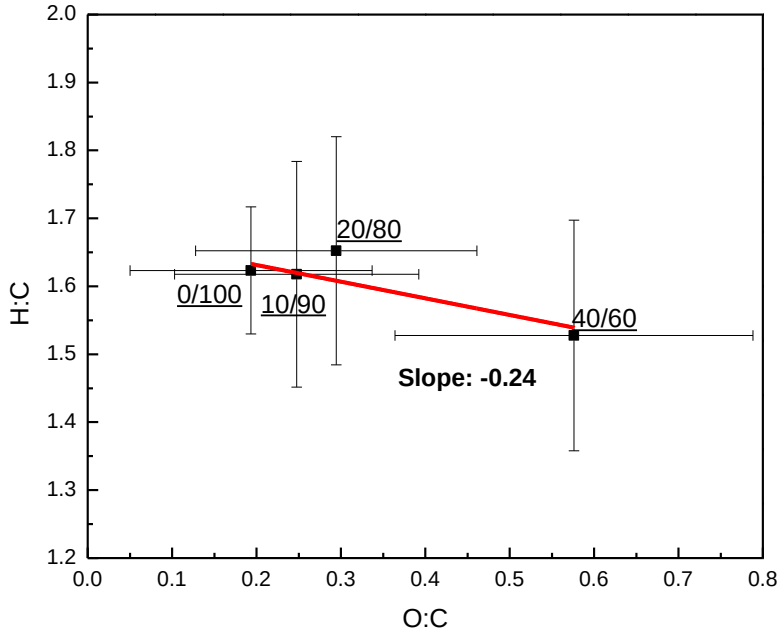


Figure S5. Van Krevelen diagram of organic aerosols produced from coal combustion under the different N_2/Air ratios (the ratios marked with underline)

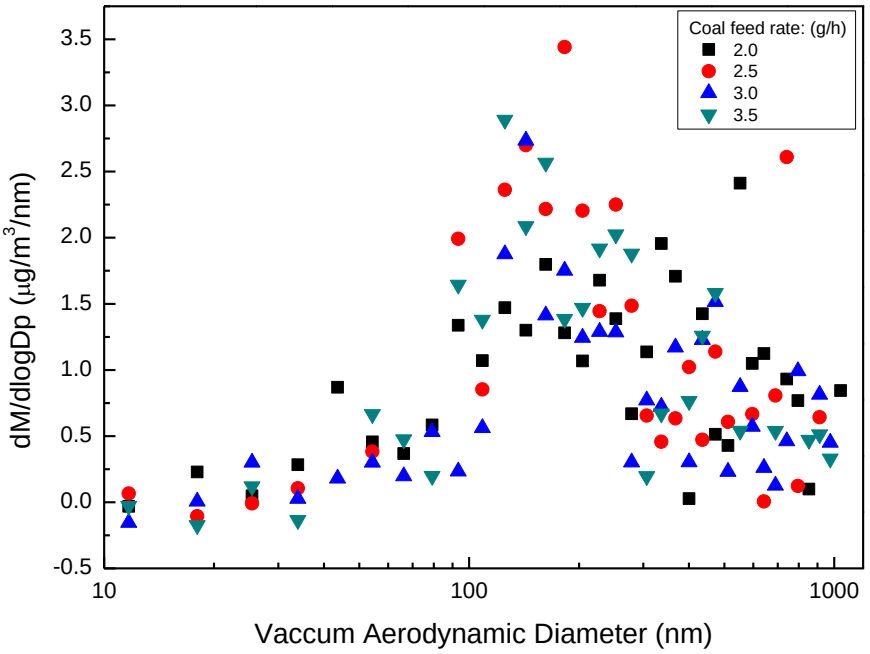


Figure S6. Mass size distribution of particulate organic matter from coal combustion at different coal feed rates (the MS signal is too low to mass size distribution for coal feed rate at 1 and 1.5 g/hr): The aerosol mass spectrometer used in this study is able to measure mass size distribution of organic matters in aerosol particles.

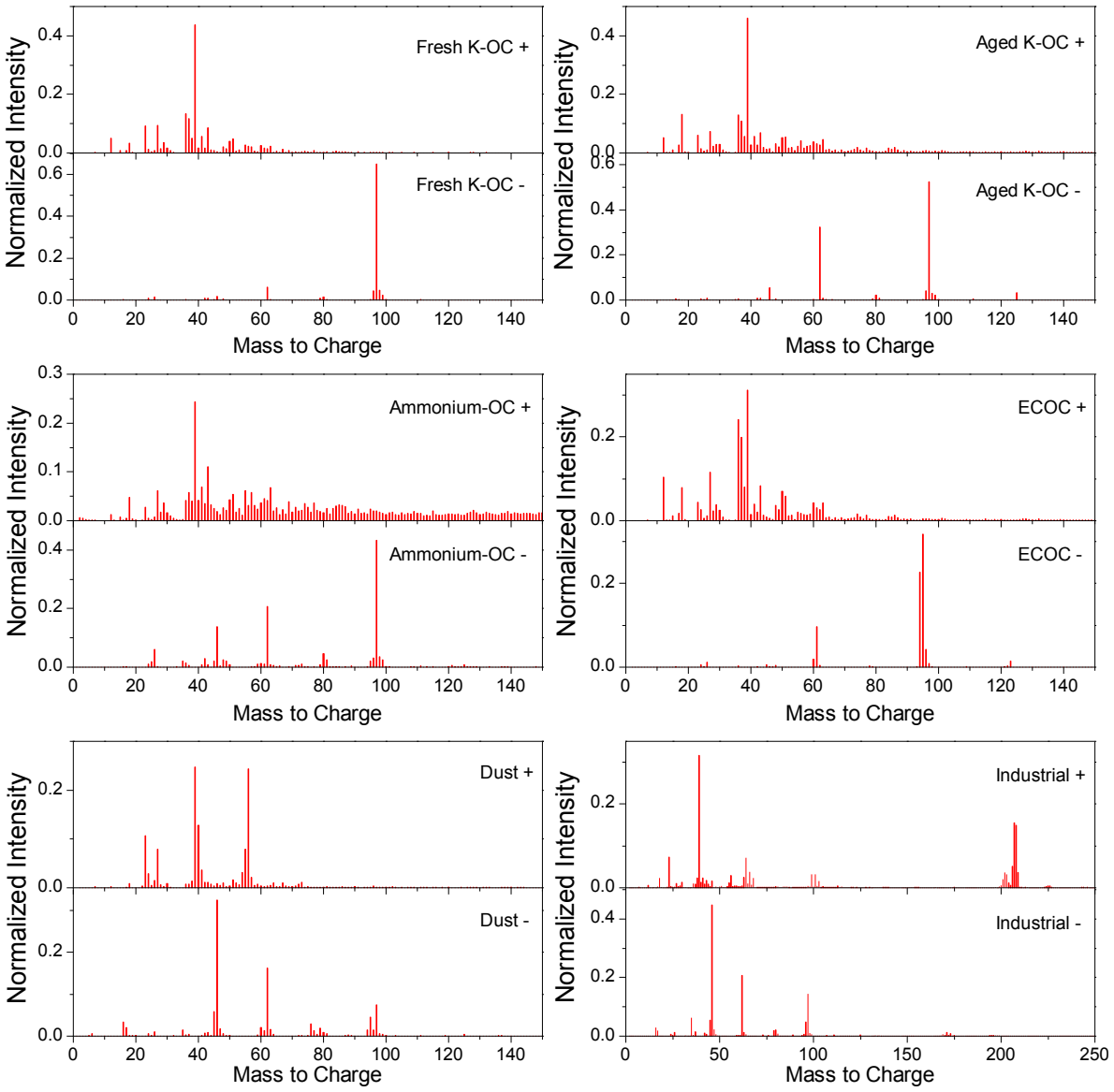


Figure S7. Average mass spectra of other 6 particle types, i.e. fresh K-OC, aged K-OC, Ammonium-OC, ECOC, Dust, and Industrial, in Shanghai using ATOFMS. The number fractions of each particle type are shown in Fig. 6 in the main text.

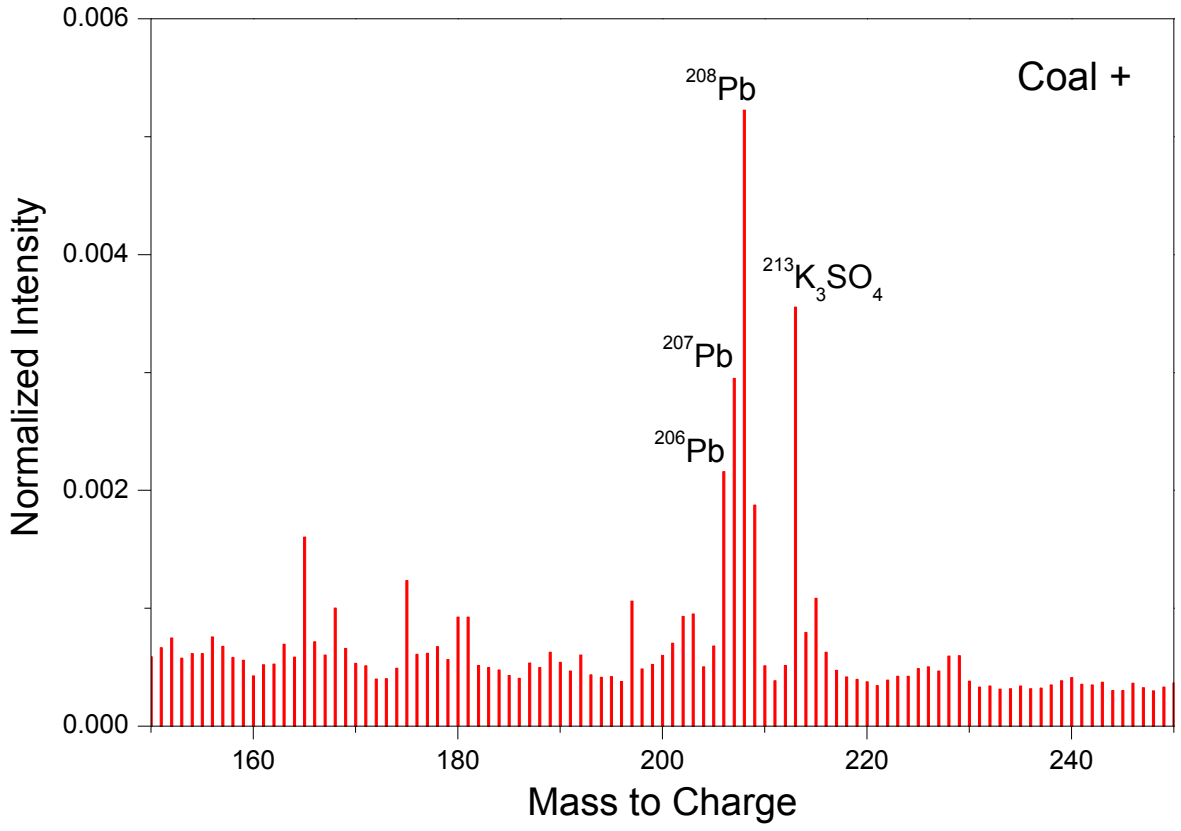


Figure S8. Average mass spectra of a dominant type (coal) of ambient aerosol in Shanghai using ATOFMS (*m/z* from 150 to 250 Da)