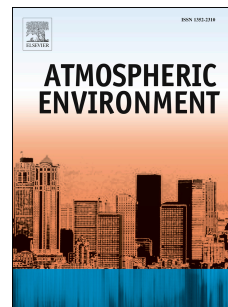


Accepted Manuscript

Influence of chemical size distribution on optical properties for ambient submicron particles during severe haze events

Wenfei Zhu, Jiangkun Xie, Zhen Cheng, Shengrong Lou, Lina Luo, Weiwei Hu, Jing Zheng, Naiqiang Yan, Bill Brooks



PII: S1352-2310(18)30520-X

DOI: [10.1016/j.atmosenv.2018.08.003](https://doi.org/10.1016/j.atmosenv.2018.08.003)

Reference: AEA 16171

To appear in: *Atmospheric Environment*

Received Date: 27 February 2018

Revised Date: 31 July 2018

Accepted Date: 4 August 2018

Please cite this article as: Zhu, W., Xie, J., Cheng, Z., Lou, S., Luo, L., Hu, W., Zheng, J., Yan, N., Brooks, B., Influence of chemical size distribution on optical properties for ambient submicron particles during severe haze events, *Atmospheric Environment* (2018), doi: 10.1016/j.atmosenv.2018.08.003.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

1 **Influence of chemical size distribution on optical properties for**
2 **ambient submicron particles during severe haze events**

3 Wenfei Zhu¹, Jiangkun Xie¹, Zhen Cheng^{1*}, Shengrong Lou^{2*}, Lina Luo¹, Weiwei
4 Hu^{3,4}, Jing Zheng⁵, Naiqiang Yan¹, Bill Brooks⁶

5 ¹School of Environmental Science and Engineering, Shanghai Jiao Tong University, Shanghai
6 200240, China

7 ²State Environmental Protection Key Laboratory of Formation of Urban Air Pollution Complex,
8 Shanghai Academy of Environmental Sciences, Shanghai 200233, China

9 ³Cooperative Institute for Research in the Environmental Sciences, University of Colorado,
10 Boulder, CO, USA

11 ⁴Department of Chemistry and Biochemistry, University of Colorado, Boulder, CO USA

12 ⁵State Key Joint Laboratory of Environmental Simulation and Pollution Control, College of
13 Environmental Sciences and Engineering, Peking University, Beijing 100871, China

14 ⁶Aerodyne Research, Inc., Billerica, MA USA

15 **Abstract** Despite of extensive efforts on investigation into characteristics of severe haze pollution
16 in megacities of China, the accurate relationships among the aerosol composition, mass-size
17 distribution and optical properties during pollution episodes remain poorly understood. Here, we
18 conducted in situ measurements of the mass size distribution of submicron aerosol (PM₁) species
19 by using a High-Resolution Time-of-Flight Aerosol Mass Spectrometer (HR-ToF-AMS), particle
20 light scattering by a Cavity Attenuated Phase Shift ALBedo monitor (CAPS-ALB) and a
21 Photoacoustic Extinctionmeter (PAX) during the winter of 2017 in Shanghai, China. The average
22 PM₁ concentration was 85.9±14.7 µg/m³ during the haze episodes, of which was ~7 times higher
23 than that of clean period (12.1±3.1 µg/m³). Organic aerosol (OA) and inorganic species (SO₄²⁻ +
24 NO₃⁻ + NH₄⁺) contributed 39.9% and 51.2% of the total mass of PM₁ during the haze episodes,
25 respectively. OA exhibited a single or bimodal distribution during the haze episodes with the peak
26 concentration of 51.8 µg/m³. There were no obvious differences between ammonium nitrate
27 (NH₄NO₃) and ammonium sulfate ((NH₄)₂SO₄) during the haze episodes, which exhibited single

* Corresponding author. Tel: +8613816159663
E-mail addresses: chengz88@sjtu.edu.cn (Z. Cheng); lousr@saes.sh.cn (SR. Lou)

Download English Version:

<https://daneshyari.com/en/article/8863392>

Download Persian Version:

<https://daneshyari.com/article/8863392>

[Daneshyari.com](https://daneshyari.com)