

Air pollution complex: Understanding the sources, formation processes and health effects

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We are experiencing the most drastic change in air quality in China. While the levels of ambient PM_{2.5} have been dropping in recent years, city clusters like Beijing-Tianjin-Hebei had frequent heavy haze episodes, and ground-level ozone keeps on going up. Therefore the emissions, meteorological and chemical processes are the key shaping the trends of air quality, and this special issue publishes 19 research and review articles addressing the progresses in understanding emissions, processes and health effects of air pollution.

Quantifying the emission sources is challenging due to their complexity and the feature of fast changing. This special issue addressed the issue from three aspects, the source profiles of PM_{2.5}, the hybrid approach for PM_{2.5} source apportionment, and the 3-dimensional assessment of VOCs emission sources by ozone formation potential, particle formation potential and toxicity, indicating the progress in understanding emission sources.

The major contributions to this special issue are from measuring current status and trends of air quality, with the focus on the process studies. Thirteen papers are collected in this direction, new particle formation is an issue of growing interest in understanding the processes from gas pollutants to particles, one paper address the diagnostic evaluation of sensitivity of ozone formation to its precursors. The papers on SORPES station and satellite retrieval show the capacity for understanding the long-term trends of air chemistry and meteorology.

As to the prevention and control of the complex air pollution, this special issue introduces the national Key Special Projects in China, perform an inter-comparison of photochemical smog problem in Los Angeles and Beijing, and provide an angle for health effect evaluation as well as disaster prevention in Anthropocene.

We believe that this special issue will, by the efforts of scientists from Europe, USA and China, provide insights and new methods for community of air chemistry and physics, and will also be of interest to decision-makers for efficient air pollution abatement measures.

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