Preface to Special Issue

Aerosol and Air Quality Research in Taiwan Cross-Strait Areas

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During the past decade, mainland China has been experiencing rapid economic development and urbanization, and this has led to significant level of environmental harm. There are thus calls for joint efforts on both sides of the Taiwan Strait to achieve greater environmental protection. In July 2011, both the Taiwan Environmental Protection Administration (TEPA) and National Sun Yat-Sen University initiated the Cross-strait Environmental Protection Forum, with the aim of promoting dialogue and cooperation among scientists, researchers, engineers, and regulatory agencies from both sides of the Strait. This annual Forum series alternates between mainland China and Taiwan, with the first Forum being held in Kinmen on June 30–July 1, 2011. During March 28–30, 2012, the second Forum was held in the city of Xiamen, which was held in conjunction with the Ninth Cross-Strait Aerosol Conference. This Forum was organized by the Institute of Urban Environment-Chinese Academy of Sciences, National Sun Yat-Sen University, and Xiamen University, with the following sponsors: the Chinese Academy of Sciences, National Natural Science Foundation of China (NSFC), Committee on Aerosol Research under Chinese Society of Particuology, and Taiwan Association for Aerosol Research (TAAR).

A total of 136 participants from mainland China, Taiwan, Hong Kong, and the United States attended the Forum, featuring more than 100 oral presentations (including seven plenary presentations) and over 100 abstracts and proceedings papers in the fields of aerosol science, air quality control and management, marine and coastal pollution, water resource management, water and wastewater treatment technology, and waste management. Amongst the total of 40 papers in this special issue, 12 were selected from the proceedings of the Second Cross-strait Environmental Protection Forum. The other 28 papers, although not presented at this Forum, were also selected because they are highly relevant to the issue of environmental protection.

Twenty-nine papers in this Special Issue are focused on aerosol related studies. Aerosols are considered the major air pollutant in most cities in Taiwan and mainland China, causing the degradation of atmospheric visibility and contributing to regional haze. Amongst these 29 papers, twelve discuss the physicochemical properties of the aerosols, either within the ambient atmosphere and/or at their sources. Five papers elaborate on the health effects associated with ambient atmospheric aerosols (Vernile et al.) and those emitted from wood combustion (Kristensson et al.), motor vehicles (Li et al.), cigarette smoking (Sahu et al.), and wastewater treatment facilities (Li et al.). Five papers discuss the development of innovative measuring/monitoring methods using remote sensing technologies (More et al. and Makokha et al.) and a filter sampling technique (Perrino et al.), as well as numerical simulation (Chang et al. and Huang et al.). The sources and fates of aerosols are also investigated via various modeling techniques (Tian et al., Li et al. and Cheng et al.) or chemical composition analytical approaches (Remoundaki et al.). Finally, two papers present the latest developments in control technologies for aerosol pollution (Huang et al. and Chuang et al.), and one paper focuses on nano-particle generation technology (Kim et al.).

In addition to aerosols, gaseous pollutants such as VOCs, NOx, CO, PAHs, and odors also have important effects on ambient air quality and human health. The emission, characterization, and control technologies of gaseous pollutants are thus discussed in eleven papers in this Special Issue. Chang et al. simulate the removal of acenaphthylene (Acpy, a PAH species) using an atmospheric plasma reactor, and found that the removal efficiency of Acpy reached 61.3%. Control technologies for chlorine species, CO2, and VOCs are also studied in several papers in this Special Issue. Tseng et al. investigate the elimination of chlorine species from coal gasification, and identify the dechlorination mechanism of Mn2O3/SiO2 sorbent in treating the related flue gas. Chen et al. evaluate the feasibility of CO2 reduction using microbial fuel cells in a wastewater treatment system. Lee et al. synthesize a new material by impregnating Y-Type zeolite with amines to adsorb CO2 in indoor environments, and show that the functionalized Y-8 adsorbent with amines has good potential for removing indoor CO2. Chen et al. optimize a pilot-scale scrubbing tower system for treating odor problems due to
composting kitchen waste. This Special Issue also features studies on the characterization of ambient PAHs, the fate of VOCs in the wastewater treatment system, and health effects of VOCs.

This Special Issue makes unique and significant contributions to the fields of environmental science and technology, and the administration of environmental protection in the cross-Strait area. As the guest editors of this Special Issue, we are very grateful to all the authors, reviewers, and the editor-in-chief of AAQR, Prof. Wen-Jhy Lee, for their tremendous efforts in putting together a high quality collection of papers highlighting the most recent progress made by researchers across the Taiwan Strait, as well as from all over the world, in better understanding and thus solving the various environmental problems we are now facing. The papers contained in this Special Issue have broader impacts beyond the specific regions and disciplines that they appear to focus on. Based on the contents of this Special Issue, we look forward to more and deeper cooperation among scientists and researchers from mainland China and Taiwan, as well as from the rest of the world, in the field of environmental protection.

**Guest Editors**

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