

RISUD Distinguished Lecture

VOCs in the Urban Atmosphere: Impacts on Air Quality and Climate Change

21 JANUARY 2020 (TUE)

5:30 PM - 6:30 PM

Room Y301, 3/F, Lee Shau Kee Building (Block Y),
The Hong Kong Polytechnic University
Medium | English



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Abstract

Severe air pollution is an environmental and human health concern in large cities throughout the world. Components of air pollution include volatile organic compounds (VOCs) and nitrogen oxides (NO_x). These compounds react to form secondary products such as ozone (O₃) and secondary organic aerosol (SOA), which in turn impact air quality and climate change. Strategies to improve air quality and mitigate climate change require detailed knowledge of the components of air pollution and how their sources evolve over time. This seminar will look at the relationships between VOCs, ozone, air quality and climate change. The seminar will also present VOC characteristics, sources and concentrations in four diverse cities in Asia that all experience episodes of severe air pollution but are at different stages of emission control strategies. The cities (populations) are Hong Kong, PRC (~7 million), Seoul, South Korea (~10 million), Mecca, Saudi Arabia (~1.5 million), and Lahore, Pakistan (~11 million). VOC levels are much lower in cities with established programs to control air pollution (Hong Kong and Seoul) than in cities with emerging emission control strategies (Mecca and Lahore), despite Mecca having the lowest population. Each city also has a characteristic “fingerprint” that reflects its major VOC sources. VOCs emitted from cleaner fuels such as LPG stand out in Hong Kong, compared to solvents in Seoul, gasoline evaporation in Mecca, and vehicle exhaust in Lahore. The results from Seoul will be used as a case study for understanding sources of reactive VOCs and their impact on ozone. Overall the results show the importance of establishing robust air quality monitoring programs to monitor VOC changes over time and to inform effective emission control strategies.

Speaker's biography

Prof. Blake is a Distinguished Professor at UCI and an Honorary Professor at the Department of Civil and Environmental Engineering of The Hong Kong Polytechnic University. He has coauthored more than 550 peer-reviewed journal articles and has given more than 150 invited academic and public lectures. He is a pioneer in understanding pollution in global and urban environments and was mentored by Nobel Laureate F. Sherwood Rowland.



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