



Carbonaceous Nanoparticles Significantly Affect Environmental Fate and Transport of Organic Contaminants

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ABSTRACT

The increasing production and use of engineered carbon nanomaterials (e.g., carbon nanotubes, fullerene and graphene/graphene oxide) makes the environmental release of these materials inevitable. More importantly, carbonaceous nanoparticles derived from pyrogenic and petrogenic sources are introduced into the environment in much larger quantities. Once released into the environment, these engineered and naturally occurring carbonaceous nanoparticles can become the predominant environmental media with which organic contaminants are associated, owing to their high adsorption affinities, and therefore, can significantly influence the transport and reactivity of environmental contaminants. This talk will focus on two significant effects of carbonaceous nanoparticles on contaminant transport and fate. First, colloidal carbonaceous nanoparticles can serve as highly effective carriers to enhance contaminant transport in subsurface environment, and the contaminant-mobilizing capabilities of carbonaceous nanoparticles are controlled by their aggregation properties, as affected by a series of physical, chemical and biological transformation under environmentally relevant conditions. Second, carbonaceous nanoparticles can mediate abiotic transformation of organic contaminants by catalyzing hydrolysis and redox reactions, and the catalytic efficiencies are strongly related to the intrinsic surface properties (e.g., types and distribution of surface O-functional groups) of carbonaceous nanoparticles. The findings may have important implications for assessing the potential environmental risks of carbonaceous nanoparticles, and may shed light on engineering of carbonaceous nanomaterials with tunable surface properties for environmental applications.

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Time: 3:00 p.m. – 4:30 p.m.

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The Hong Kong Polytechnic University

SPEAKER'S BIOGRAPHY

Wei CHEN is a professor of environmental science and engineering at Nankai University, Tianjin, China, and an adjunct professor of the Department of Civil and Environmental Engineering at Rice University, Houston, TX, USA. Prof. Chen received his B.S. in environmental chemistry from Nankai University in 1992, and M.S. and Ph.D. in environmental science and engineering from Rice University in 1997 and 2000. Prof. Chen's current research interests are fate, transport and effects of engineered and naturally occurring nanoparticles in the environment, as well as nanomaterial-enabled remediation technologies. Prof. Chen has been the director of Tianjin Key Laboratory of Environmental Remediation and Pollution Control since 2004. He is currently an editor of *Environmental Toxicology and Chemistry*, and is on the editorial (advisory) boards of *Environmental Science & Technology*, *Environmental Science: Nano*, *Science of the Total Environment* and *Journal of Environmental Sciences*. Prof. Chen is a member of the management committee of International Water Association (IWA) "Nano and Water" specialist group.

*** All Interested Are Welcome ***

For further information, please contact Dr. Dan Tsang at Tel. 2766-6072.

Free admission. Certificates of attendance will be provided to registered participants if they attend the whole lecture.