

EXPERIMENTS AT THE INTERFACE OF CARBON PARTICLE CHEMISTRY AND TOXICOLOGY

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Air pollution includes a complex mixture of carbonaceous gases and particles emitted from multiple anthropogenic, biogenic, and biomass burning sources, and also includes secondary organic components that form during atmospheric aging of these emissions. Exposure to these mixtures has clear adverse health outcomes as demonstrated by increased morbidity and mortality; yet, disentangling the sources and chemical components responsible for these effects has presented serious chemical, analytical, and bio-analytical challenges. In this presentation, we attempt to look forward and examine how current analytical strategies may be applied for investigating health effects due to complex carbon particle mixtures. Examples of volatility-based toxicology models are introduced, and the feasibility of developing a physiological-based fluid extraction model for hydrophobic organic compounds in the lung is also discussed. Finally, the usefulness of harmonizing advanced carbon particle chemical fingerprinting techniques with health effects related studies will be covered.