Geophysical Research Abstracts, Vol. 9, 04699, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-04699


# The Role of Carbonaceous Materials in the Fate of Polycyclic Aromatic Hydrocarbons in a Small Urban Watershed

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Long-term non-point source pollution caused by particle-associated contaminants (PACs) in urban lakes and streams is a worldwide problem. The dual role of carbonaceous materials (CMs) in urban watersheds as both a sink and source of PACs is not well characterized. The objectives of this study are 1) to determine the types and amounts of CM particles that persist in a watershed with runoff into receiving streams, transport as suspended particles, and settling, accumulation and burial in lake sediments, and 2) to identify the relationship between CM properties and PAC loadings. We focus on only one class of PACs, polycyclic aromatic hydrocarbons (PAHs), due to their widespread occurrence and toxicity in lake sediments. Samples were collected from the Lake Como watershed in Fort Worth, Texas. They include residential and commercial soils, residential street dust, sealed and unsealed parking lot dust, stream sediments, and lake sediments as a function of depth. All samples are subject to CM characterization by two complementary methods: 1) density separation followed by a series of chemical treatment methods and 2) petrographic analysis. PAH concentrations in bulk samples and in density separated fractions are analyzed. Results indicate that the majority of CMs ($>$70%) are associated with the density separated heavy fractions, and that the resistance of CMs to acid treatment increases with sediment depth. PAH concentrations are two to three orders of magnitude greater in the sealed parking lot dust than any other samples. PAH concentrations in the suspended stream sediments are four to six times greater than those in the stream bed sediments and lake sediments, and most PAH concentrations generally increase with sediment depth. Relationships between CM properties and PAH concentrations will be presented, as well as implications for watershed management.