

Abstract of Exponent's presentation at the Society of Environmental Toxicology and Chemistry (SETAC) annual meeting in Portland, OR Nov 7 – 11, 2010

PAHs in urban sediments: Forensic approaches for assessing the relative contribution of atmospheric deposition and parking lot sealants K. O'Reilly, J. Pietari, P. Boehm, Exponent

Coal tar-based pavement sealants have been suggested as an important source of PAHs in urban sediment. While this claim is based in part on similarities in the PAH chemistry of coatings and some sediment, further source apportionment is warranted. In a recent study we applied a range of forensic approaches to more than 150 environmental samples including coal tar-based products, runoff from sealed parking lots, atmospheric deposition, soils, highway runoff, and urban pond sediments. Data evaluation approaches included source ratio and double ratio comparisons, histogram pattern recognition, relative ring-class fractions, chemical correlations, and principal component analysis. Given the generic pyrogenic PAH pattern of many of the samples, some of the methods, including source ratios and chemical correlations, could not adequately distinguish the influence of the potential sources of PAHs. Pond sediments that correlated with sealants also correlated with atmospheric particles. Double ratio plots indicated a narrower range of results for sealant products compared to the environmental samples. While samples collected from roofs and roads were similar to sealants, atmospheric particles and urban sediments had the widest range of ratios, suggesting underlying sources that differ by location. Principal component analysis also suggested that there were similarities between the particles collected from sealed lots, roofs, and roads, but that these were different from urban pond sediments. Sediments were more similar to atmospheric particles than to sealant associated samples. **The results indicate that sealants are not a primary source of PAHs in urban sediments.** The goal of this presentation is to suggest strategies for developing site-specific approaches for assessing the relative contribution of PAH sources including atmospheric deposition and sealants. It should include both chemical and mass balance methods, and it is critical that it considers the full range of potential sources. Based on the data available, our prior study focused on the 16 PAHs classified by the EPA as priority pollutants. Methods for incorporating alkylated PAH and related heterocyclic analysis into a source allocation effort will be discussed.