

Performance-Based Quality Assurance Programs for the Determination of PAHs in Marine Tissue, Sediment, and Air Particulate Matter Samples

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Since the beginning of the National Oceanic and Atmospheric Administration (NOAA) National Status and Trends (NS&T) Program in 1987, the National Institute of Standards and Technology (NIST) has coordinated interlaboratory comparison exercises for the determination of polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyl (PCB) congeners, and chlorinated pesticides in marine tissue (mussel and fish) and sediment samples. In 1991, NIST and NOAA initiated an interlaboratory comparison exercise program patterned after this exercise using marine mammal blubber as the exercise materials for the determination of organohalogen compounds.

Since 2000, NIST has been collaborating with the U.S. Environmental Protection Agency (EPA) to provide interlaboratory comparison exercises to improve the accuracy and comparability of organic speciation measurements in air particulate matter (PM). As part of the NIST/EPA collaboration, the Organic Speciation Working Group was formed in 2000 to assist in this effort by participating in interlaboratory comparison studies and to provide input for the development of Standard Reference Materials (SRMs) to support these measurements. To date, this group has participated in three interlaboratory comparison studies for the determination of a wide range of analytes, including PAHs, nitrated PAHs, alkanes (including hopanes and cholestanes), sterols, carbonyl compounds (ketones and aldehydes), acids (alkanoic and resin), phenols, and sugars in PM-related samples.

Because these interlaboratory comparison studies are performance-based, participating laboratories are encouraged to use the analytical methods that they routinely use in their laboratories to analyze marine tissue, sediment, or PM samples. The results from the participating laboratories, following outlier testing, are used to assign a consensus concentration for each analyte in the unknown samples. Results are used in the consensus value assignment for the unknown sample only if the laboratory's results for analysis of related reference material (control) are within 30% of the uncertainty limits of the certified values. The consensus values, accuracy, precision assessments, and the methods used by each laboratory are summarized in a report provided to the participants. The results from the most recent interlaboratory comparison studies will be presented with particular emphasis on the comparability among the PAH data received for marine tissue, marine sediment, and PM samples (including nitrated PAH data received for the PM).

Although this work was reviewed by EPA and approved for publication, it may not reflect official Agency policy.