255.
EVALUATION OF SURROGATE STANDARDS FOR GC/MS QUANTITATION OF ASPHALT FUME CONDENSATE.

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Asphalt is a complex mixture of aliphatics, polycyclic aromatic hydrocarbons, substituted aromatic compounds, and other miscellaneous compounds. Several methods of quantification have been used to assess fume concentration for industrial hygiene studies. These include benzene-extractable components weight from gravimetric sampling, fluorescent assessment for polyaromatic hydrocarbon (PAH) content, and total fume concentration relative to PAH or kerosene. Finding an appropriate standard to quantify this type of mixture can be difficult, resulting in potential gross quantitative underestimation or overestimation. In the present study, road paving—like asphalt fume—was generated (150°C), collected onto a sampling train consisting of a HEPA filter (particulate phase) followed by XAD-2 (volatile phase), and both were extracted with dichloromethane. Density of the particulate phase was 1.84 g/ml. Kerosene, standard mixture containing 16 priority PAH compounds, and aliphatic standards (C_8–C_{36}) were evaluated by gas chromatograph-mass spectrometry (GC-MS) for similarity of simulated boiling point profiles, and relative total ions vs. asphalt fume extracts. Fluorescence methods were also evaluated before and after HPLC separation from aliphatic components using a poly-divinylbenzene column. Fluorescence was found to be problematic for the quantification of total PAHs from this complex mixture. The kerosene reference standards' boiling point profile was closer to that of the asphalt fume than the other standards evaluated. The total asphalt fume particulate concentration was overestimated (using GC-MS analyses) by 16.7-, 1.8- and 1.7-fold using the PAH mixture, the kerosene reference standard, and the aliphatic reference standard mix respectively. These results underscore the difficulty in assessing and quantifying the concentration of complex mixtures from occupational environments. This research was funded in part by an interagency agreement with NIEHS/NTP, interagency agreement Y1-ES-9045-01.

256.
SAMPLING RATE AND SAMPLE CAPACITY STUDIES IN OPTIMIZING DIFFUSIVE SAMPLERS DESIGNS.

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In developing samplers for air contaminants in industrial environments, researchers face three challenges. First, selecting sampling media on which contaminants can be collected, stored, and recovered (e.g., activated carbon for neutral organics). Regardless of sampling media chosen, the other challenges consist of collecting a quantity of contaminant that is large enough to perform accurate analysis and small enough that sampling media capacity is not exceeded. In early active sampling methods, sample capacity was obtained by increasing the mass of carbon in sampling trains (e.g., jumbo tubes and multitube samplers). Later, it was noticed that the goal of increasing the ratio of charcoal mass to sample volume can be achieved equally well either by increasing charcoal mass in the sampling train or by decreasing the air volume sampled. Increasing the mass of sampling media has disadvantages; namely, that multiple tests are required to analyze multiple tubes and extra solvent is required to analyze jumbo tubes. Conversely, if extra sample capacity can be achieved by lowering sampling rate, volatile contaminants may be collected on a small, economical sampler, while modern analytical lab technologies have made analysis of small amounts of contaminants cost-effective and convenient. For

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