

Polycyclic aromatic hydrocarbons (PAH) in ambient air: sources and sampling

Editorial

Ambient air gets polluted with various pollutants, not limited to nitrogen oxides, sulphur oxides, polycyclic aromatic hydrocarbons (PAH), and volatile organic compounds (VOC). Among these pollutants, PAH receives more attention of environmental researchers due to their impact on environment and human health. Ambient air contains a number of PAHs but US EPA (Environmental Protection Agency) considered 16 compounds as prior PAH based on their availability and health effects to humans. The 16 EPA prior PAHs are including naphthalene (Nap), acenaphthylene (Acy), acenaphthene (Acp), fluorine (Flu), phenanthrene (Phe), anthracene (Ant), fluoranthene (Flt), pyrene (Pyr), benz [a] anthracene (BaA), chrysene(Chry), benzo [b] fluoranthene (BbF), benzo[k] fluoranthene(BkF), benzo[a] pyrene(BaP), indeno [1,2,3-cd] pyrene (IcdP), dibenz [a,h] anthracene (DahA) and benzo [ghi] perylene (BghiP). The structures of these PAHs are shown in Figure 1.

Based on the carcinogenicity, the International Agency for Research on Cancer (IARC) classified these EPA prior 16 PAHs into four groups. Group 1 compounds (proven as human carcinogens) which consists of only one PAH (BaP), group 2A compounds (probably carcinogens) consists of DahA, group 2B compounds (possibly carcinogens) consists of Nap, BaA, Chry, BbF, BkF, and IcdP and group 3 compounds (not classified as carcinogenic to humans) consists of Acy, Acp, Flu, Phe, Ant, Flt, Pyr and BghiP.

The major sources of PAH into the atmosphere are classified

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into two types including natural and anthropogenic. The natural sources of PAH are including forest fires and volcanic eruptions. The anthropogenic sources are including the both mobile (transportation sources) and stationary (combustion sources).

Now a days, most of the researchers are determining the concentrations of PAH in the atmosphere in all over the world due to their health impact on human beings. Most of the researchers were used a high volume sampler to collect the particulate matter for the analysis of PAH in the atmosphere. The vapor phase PAH was collected usually on PUF (polyurethane foam). The sampling of particulate matter to analyze the PAH through a high volume sampler is shown in Figure 2.

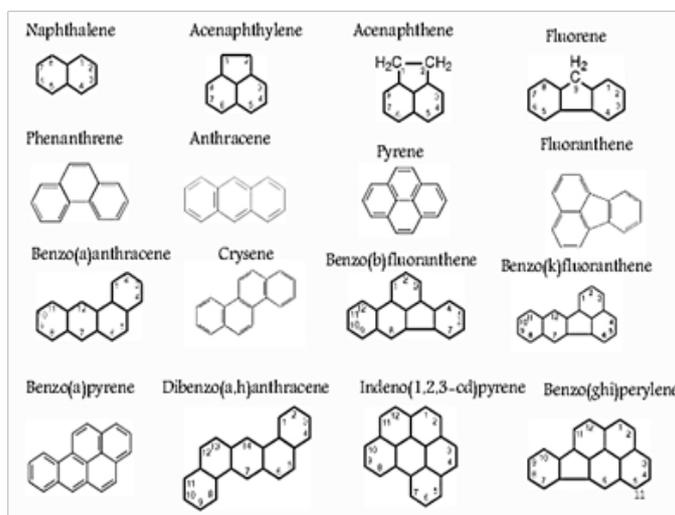


Figure 1 Structures of 16 EPA prior PAHs.

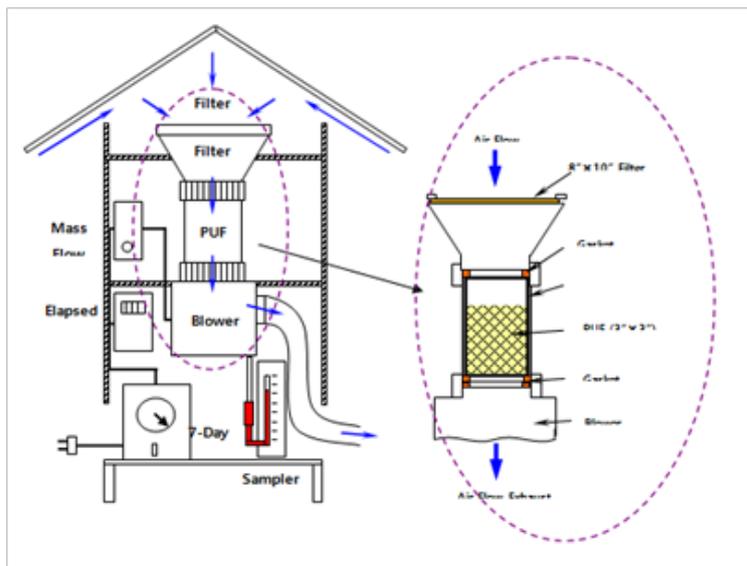


Figure 2 Collection of total suspended particulate matter and vapor phase PAHs with high volume sampler.

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Conflict of interest

The author declares no conflict of interest.