



## Just the Facts...

## PAH, PNA COMPOUNDS

**PAHs** – Polycyclic Aromatic Hydrocarbon compounds, also known as Polynuclear Aromatics (PNAs)

### *They are:*

- A series of over one hundred different individual compounds
- Formed during the incomplete burning of coal, gas, garbage, or other organic substances
- Widely distributed in the environment
- In motor vehicle (especially diesel) exhaust
- In cigarette smoke and meat cooked at high temperatures
- Byproducts of the degradation of wood and other vegetative matter
- Present in creosote and as a by-product of coking operations in steelmaking
- Potentially present as pollutants in water, air, soil, and industrial products

### *Characteristics:*

- Will last in the environment for months to years
- Generally occur as mixtures rather than individual PAH compounds
- Adsorb readily onto solid particles such as soil, dust, and soot
- Characterized by multiple fused benzene ring structures
- Considered semi-volatile organic compounds
- Some PAHs readily evaporate into the air
- Degrade in sun/UV light

### *Primary Human Health Concerns:*

- Health effects differ from compound to compound
- Some PAH compounds can induce cancer
- The most toxic common PAH is benzo(a)pyrene
- PAHs are among the most potent known human carcinogens
- Primarily attack the liver (cancer) if ingested and lungs (cancer) if inhaled

### *The common PAHs include:*

acenaphthene	benzo(b)fluoranthene	fluoranthene
acenaphthalene	benzo(g,h,i)perylene	fluorene
anthracene	benzo(k)fluoranthene	indeno(1,2,3-cd)pyrene
benzo(a)anthracene	chrysene	naphthalene
benzo(a)pyrene	dibenz(a,h)anthracene	phenanthrene
		pyrene

***Sampling and Analysis:***

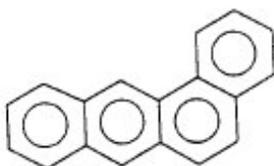
- collected from air on a solid sorbent or using impingers
- extracted directly from soils, waters, and industrial products
- analyzed by several chromatographic methods
- some field analysis kits are available

***Examples of the Chemical Ring Structures of several PAH Compounds:***

**Anthracene – C<sub>14</sub>H<sub>10</sub> -**



**Benzo(a)anthracene - C<sub>18</sub>H<sub>12</sub> -**



**Benzo(a)pyrene – C<sub>20</sub>H<sub>12</sub> -**



**Benzo(g,h,i)perylene – C<sub>22</sub>H<sub>12</sub> -**

