



BNA COMPOUNDS

- BNAs** - acronym for Base/Neutral/Acid Extractable Compounds
- also classified as Semi-volatile Organic Compounds (SVOCs)
- also termed "extractables"

They are:

- ▶ generated from industrial operations and/or the incomplete combustion products from incinerators
- ▶ monitored as part of national environmental legislations (RCRA, NPDES, etc.)
- ▶ approximately 70 individual regulated compounds
- ▶ representative of a wide range of organic compound types
- ▶ potentially present as pollutants in air, water, soil, and industrial products

Chemical Characteristics:

- ▶ considered "semi-volatile" organic compounds, not readily evaporating into air
- ▶ require extraction into an organic solvent prior to analytical determination

Primary Human Health Concern:

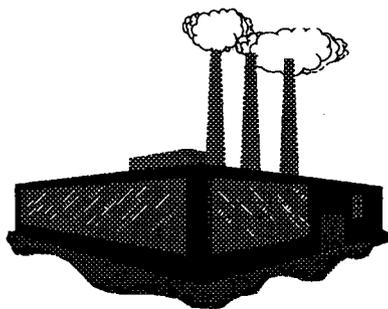
- ▶ varies from known carcinogens to unknown health effects
- ▶ known carcinogens include benzidine, dinitrotoluene, benzo(a)pyrene
- ▶ many are listed in 40 CFR as hazardous compounds

Some common BNA compound series include:

- ◆ Polynuclear aromatic compounds such as
naphthalene, anthracene, pyrene, fluoranthene
- ◆ Chlorinated hydrocarbons such as
dichlorobenzenes, trichlorobenzenes, hexachloroethane, hexachlorobenzene
- ◆ Nitroaromatic compounds such as
nitrobenzene, dinitrotoluenes, benzidine
- ◆ Phthalate compounds such as
dimethyl phthalate, dibutyl phthalate, diethyl phthalate
- ◆ Phenols such as
pentachlorophenol, phenol, nitrophenol, chlorophenol

Sampling and Analysis

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



◆ **Definition**

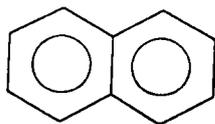
◆ **Characteristics**

◆ **Health Concerns**

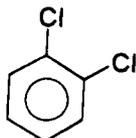
Environmental Health Consultant
U.S. Army Center for Health Promotion and Preventive Medicine
Commercial (410) 671-2208 or DSN 584-2208
email: rvalis@aeha1.apgea.army.mil

Examples of Chemical Formulas and Structures of some BNAs:

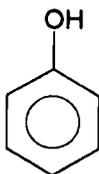
naphthalene -- $C_{10}H_8$ --



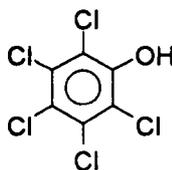
dichlorobenzene (1,2) -- $C_6H_4Cl_2$ --



phenol -- C_6H_6O --



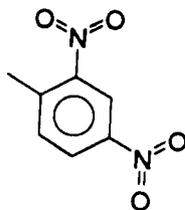
pentachlorophenol -- C_6HCl_5O --



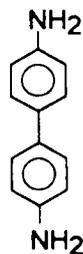
nitrophenol (4) -- $C_6H_5NO_3$ --



dinitrotoluene (2,4) -- $C_7H_6N_2O_4$ --



benzidine -- $C_{12}H_{12}N_2$ --



dimethyl phthalate -- $C_{10}H_{10}O_4$ --

