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8 Polycyclic Aromatic Hydrocarbons (PAHs)

Polycyclic aromatic hydrocarbons (PAHs) are among the most common chemicals of concern at contaminated sites and, as with lead and arsenic, there is considerable interest in incorporating PAH bioavailability estimates in human health risk assessments. The development of methods for estimating PAH bioavailability, however, has lagged considerably behind methods for lead and arsenic because assessing bioavailability for this class of compounds is complex. Also, in contrast to lead and arsenic, dermal absorption is potentially a significant contributor to risk. There are no consensus models for estimating PAH bioavailability at present, but promising approaches are beginning to appear in the literature. This section describes the nature of PAHs, how they are introduced to the environment, methodologic issues related to estimating their bioavailability and bioaccessibility for soil from both oral and dermal routes of exposure, and an overview of studies that have been performed to date to estimate PAH bioavailability.

PAHs are stable, neutral, aromatic organic chemicals consisting of numerous carbon atoms configured to form multiple rings. There are more than 10,000 different PAH compounds. Pure PAHs usually exist as colorless, white, or pale yellow-green solids. Many reference sources for chemical properties of PAHs are available in Section 2.4 of the Regional Screening Table User's Guide (USEPA 2017d). The general characteristics of PAHs are high melting and boiling points, low vapor pressures, and very low aqueous solubilities. PAHs are generally soluble in organic solvents and can accumulate in fats because they are highly lipophilic.