The ToxGuide™ is developed to be used as a pocket guide. Tear off at perforation and fold along lines.

Sources of Exposure

General Populations

- Exposure to ethylbenzene is possible through contact with gasoline, automobile emissions, solvents, printing inks, varnishes and paints, and other consumer products.
- Cigarette smoke is also a source of ethylbenzene exposure.
- Ground water from sources near manufacturing and processing facilities, petroleum refineries, and leaking underground storage tanks may be contaminated with ethylbenzene.

Occupational Populations

- Occupational exposures are expected within the petroleum industry, industries using solvents, paints, and coatings, and during the manufacture and handling of ethylbenzene and styrene.

Toxicokinetics and Normal Human Levels

Toxicokinetics

- Ethylbenzene is well absorbed from the lungs, gastrointestinal tract, and through the skin.
- Absorbed ethylbenzene is rapidly eliminated by metabolism and excretion of metabolites; the half-time in blood is less than 1 hour.
- The major metabolic pathways are side-chain and ring hydroxylation with subsequent formation of glucuronide and sulfate conjugates.
- Ethylbenzene metabolites, primarily conjugates, mandelic acid, and phenylglyoxylic acid, are excreted in the urine.

Normal Human Levels

- No data available.

Biomarkers/Environmental Levels

Biomarkers

- Ethylbenzene can be measured in blood, subcutaneous fat, and in expired air.
- Expired air concentrations have been correlated with levels of ethylbenzene in ambient air.
- Urinary levels of mandelic acid and/or phenylglyoxylic acid. However, these are also elevated following exposure to styrene.

Environmental Levels

Air

- Median ethylbenzene concentrations of 0.6 ppb in urban and suburban air and 0.01 ppb in rural air have been reported.

Sediment and Soil

- Ethylbenzene is rarely detected in soil.

Water

- Ethylbenzene is rarely detected in drinking water.

Reference

Agency for Toxic Substances and Disease Registry (ATSDR). 2010. Toxicological Profile for Ethylbenzene. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Services.

ToxGuide™ for Ethylbenzene

C_8H_{10}

CAS# 100-41-4

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U.S. Department of Health and Human Services
Public Health Service
Agency for Toxic Substances and Disease Registry
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ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

Chemical and Physical Information

Ethylbenzene is a Liquid

- Ethylbenzene is a colorless liquid with an aromatic odor, and is flammable and combustible. Ethylbenzene is naturally found in crude petroleum and is widely distributed in the environment.
- It is a high production volume chemical primarily used for the production of styrene. Ethylbenzene is also used as a solvent and in the manufacture of several organic compounds other than styrene.
- Consumer products containing ethylbenzene include gasoline, paints and varnishes, inks, pesticides, carpet glues, automotive products, and tobacco products.

Routes of Exposure

- Inhalation – Predominant route of exposure for general population and workers.
- Oral – Minor route of exposure via ingestion of contaminated water.
- Dermal –Skin contact may occur during showering or bathing with contaminated water or from contact with contaminated soil or products containing ethylbenzene.

Ethylbenzene in the Environment

- Ethylbenzene partitions primarily to air and removal via photochemically generated hydroxyl radicals is an important degradation mechanism. The half-life in air is approximately 1–2 days. Ethylbenzene is ubiquitous in ambient air, mainly as a result of automobile emissions.
- In surface water, most of the ethylbenzene will evaporate. The remaining ethylbenzene is broken down through photooxidation and biodegradation.
- Ethylbenzene is moderately mobile and biodegrades in soil.
- Ethylbenzene does not appear to bioconcentrate in aquatic food chains.

Relevance to Public Health (Health Effects)

Health effects are determined by the dose (how much), the duration (how long), and the route of exposure.

Minimal Risk Levels (MRLs)

Inhalation

- An MRL of 5 ppm has been derived for acute-duration inhalation exposure (≤14 days).
- An MRL of 2 ppm has been derived for intermediate-duration inhalation exposure (15–364 days).
- An MRL of 0.06 ppm has been derived for chronic-duration inhalation exposure (≥1 year).

Oral

- No acute-duration oral MRL was derived for ethylbenzene.
- An MRL of 0.4 mg/kg/day has been derived for intermediate-duration oral exposure (15–364 days).
- No chronic-duration oral MRL was derived for ethylbenzene.

Health Effects

- Exposure to high levels of ethylbenzene can cause eye and throat irritation, vertigo, and dizziness.
- In animals, the most sensitive target of ethylbenzene toxicity appears to be the auditory system; a potentially irreversible damage to cochlear hair cells and hearing loss have been observed in rats following acute and intermediate-duration inhalation exposure and acute oral exposure.
- Animal studies indicate that intermediate-duration oral exposure can be hepatotoxic.
- Direct contact with liquid ethylbenzene caused eye and skin irritation in animals.
- Developmental effects (decreases in growth and increased skeletal variations) have been observed in animals following inhalation exposure to high levels of ethylbenzene.
- IARC has classified ethylbenzene as possibly carcinogenic to humans (Group 2B).

Children's Health

- Children are expected to be affected by ethylbenzene poisoning in the same manner as adults.