

Sources of Exposure

Toxicokinetics and Normal Human Levels

Biomarkers/Environmental Levels

ToxGuide™

for

Creosote

(wood creosote, coal tar creosote, coal tar, coal tar pitch, coal tar pitch volatiles)

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8007-45-5
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U.S. Department of Health and
Human Services
Public Health Service
Agency for Toxic Substances
and Disease Registry
www.atsdr.cdc.gov

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General Populations

- The general population will only be exposed to creosote at low levels. Coal tar creosote is restricted for use to certified applicators only.
- Potential sources of exposure to creosote include contact with creosote-treated wood products, incineration of creosote-treated scrap lumber, or ingestion of contaminated ground water.
- Exposure may also occur during the therapeutic use of coal tar dandruff shampoos, coal tar ointments for treatment of eczematous dermatitis or psoriasis.
- Exposure may also occur through ingestion of dietary supplements or tea that contains leaves from the creosote bush.

Occupational Populations

- Individuals who work in the wood-preserving industry make up the largest percent of the population that might be exposed to coal tar creosote.
- Exposure to coal tar pitch and coal tar pitch volatiles may occur in asphalt workers; rubber, aluminum, iron, steel and tire factory workers; and in coke-producing industries.

Toxicokinetics

- Creosotes and coal tar products can enter the body through the lungs, stomach, intestines and skin; although there are limited data quantifying absorption efficiency.
- Some components of creosote may be stored in the body fat and may be found in breast milk. Coal tar components may be metabolized.
- Components of creosotes and coal tar products are primarily excreted in the stool, with a small amount excreted in urine.

Normal Human Levels

- No data available.

Biomarkers

- No specific biomarkers of exposure have been identified for creosote or coal tar products. Excretion of components of these mixtures or their metabolites can be used as biomarkers of exposure, although they are not specific to creosotes.

Environmental Levels

Air

- No data were available regarding ambient atmospheric concentrations of wood or coal tar creosote-derived components.

Sediment and Soil

- No data were available regarding concentrations of wood or coal tar creosote-derived components in soil or sediment.

Water

- No data were available regarding concentrations of wood or coal tar creosote-derived components in water.

Reference

Agency for Toxic Substances and Disease Registry (ATSDR). 2002. Toxicological Profile for Wood Creosote, Coal Tar Creosote, Coal Tar, Coal Tar Pitch, and Coal Tar Pitch Volatiles. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Chemical and Physical Information

- Creosote is the name used for a variety of products that are mixtures of many chemicals. They are created by high-temperature treatment of beech and other woods.
- Coal tar creosote is the most common form of creosote in the workplace and at hazardous waste sites in the U.S. It is a thick, black, oily liquid that does not dissolve easily in water. Coal tar creosote is widely used as a wood preservative; its use is restricted to certified applicators. It is also used to treat skin diseases such as psoriasis and as an insecticide and fungicide.
- Wood creosote is a colorless to yellowish greasy liquid with a characteristic smoky odor and sharp burned taste. It is soluble in water and is derived from the resin of leaves of the creosote bush and beechwood. Beechwood creosote is no longer produced in the U.S.
- Coal tar and coal tar pitch are thick, black or brown liquids or semisolids with a smoky aromatic odor. They are distillation products of coal tar. Residues are found in chimneys of homes heated with coal.

Routes of Exposure

- Inhalation – Minor route of exposure for the general population. Predominant route of occupational exposure.
- Oral – Major route of exposure for the general population.
- Dermal – Major route of exposure for the general and occupational populations.

Creosote in the Environment

- Coal tar creosote is the major type of creosote found in the environment. It is released to water and soil mainly as a result of its use in the wood preservation industry.
- Some components of coal tar creosote dissolve in water. Those that dissolve move through soil and leach into groundwater, where they persist and take years to break down. Components that do not dissolve will remain in a tar-like mass.
- In soil, breakdown can take months for some components and longer for others.
- Coal tar creosote that remains in soil or water is toxic to animals and possibly to humans.
- 1–2% of coal tar creosote applied to treated wood is released into air.
- Once in the environment, plants and animals can absorb parts of the creosote mixture.

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

- No acute-, intermediate-, or chronic duration inhalation MRLs were derived for wood creosote, coal tar creosote, coal tar, coal tar pitch, or coal tar pitch volatiles.

Oral

- No acute-, intermediate-, or chronic duration oral MRLs were derived for wood creosote, coal tar creosote, coal tar, coal tar pitch, or coal tar pitch volatiles.

Health Effects

Wood Creosotes

- Liver, kidney and dermal effects have been observed following oral or dermal exposure to wood creosotes.

Health Effects (continued)

Coal tar and coal tar products

- Brief exposure to large amounts of coal tar creosote may result in a rash or severe irritation of the skin, chemical burns of the surfaces of the eye, convulsions and mental confusion, kidney or liver problems, unconsciousness, or death.
- Prolonged dermal or inhalation exposures to low levels of coal tars may result in increased sensitivity to sunlight, damage to the cornea, skin reddening, blistering or peeling, or irritation to the respiratory tract.
- Developmental effects have been observed in animals orally exposed to high doses of coal tar.
- Increased cancer risks have been observed in coal tar creosote, coal tar, and coal tar products workers. IARC has determined that coal tar is carcinogenic to humans and that creosote is probably carcinogenic to humans. EPA has determined that coal tar creosote is a probable human carcinogen.

Children's Health

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