



Product Stewardship Summary Heavy Pyrolysis Oil and Light Pyrolysis Oil

The product stewardship summary is intended to give general information about the chemical or categories of chemicals addressed. It is not intended to provide an in-depth discussion of all health and safety information. Additional information on this chemical is available through the applicable Safety Data Sheet which must be consulted before using this chemical. The product stewardship summary does not supplant or replace required regulatory and/or legal communication documents.

Chemical Identity:

Heavy Pyrolysis Oil (HPO) and Light Pyrolysis Oil (LPO) are byproducts of ethylene produced by Chevron Phillips Chemical's plant in Cedar Bayou, Texas. HPO is the residual fraction from the distillation of the products of the steam cracking process to produce ethylene. HPO is continuously removed from the bottom of the gasoline fractionator. LPO is a lighter fraction and produced in the same way as HPO. The mixed fuel oil streams are separated by distillation from each other to produce LPO and HPO.

HPO CAS Number: 64742-90-1 Synonyms : Residues (petroleum), steam-cracked; Heavy Aromatic Pyrolysis Oil; Heavy Fuel Oil; HFO; HPO; Ethylene Tar; Pyrolysis Oil; Ethylene Bottoms

LPO CAS Number: 68477-40-7 Synonyms : Distillates (petroleum), light steam-cracked naphtha; Light Fuel Oil; Light Pyrolysis Gasoline; LFO; LPO

Product Uses:

There are no consumer uses of HPO and LPO and they are used only at industrial facilities. HPO is burned as fuel in the chemical plant where it is made. HPO is also sold to industrial customers who blend and re-sell HPO and other fuel oils into the fuel oil market. LPO is used to extract the naphthalene or to blend into fuel oil.

Physical/Chemical Properties:

HPO and LPO are dark color liquids under ambient temperature and pressure. LPO is classified as flammable by the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). They are stored and shipped at high temperatures. During loading, a component, namely, naphthalene, may vaporize and form crystals which could affect the safety valve. Some operations may cause static electricity to accumulate creating the potential for a fire. Static hazards can be minimized by proper bonding and grounding. Drums of these materials may rupture with explosive force if pressure is used to empty the drum. Empty drums, which retain product residue, may explode if pressurized, cut, welded, brazed, soldered, drilled, ground, or exposed to heat, flame, sparks, static electricity, or other sources of ignition. To minimize risks, special handling and storage procedures are required.

Health Information:

The acute toxicity of HPO and LPO is low, but ingestion may present an aspiration hazard; further, the data for the component naphthalene indicate that ingestion may cause hemolytic anemia, especially in humans deficient in the enzyme glucose-6-dehydrogenase. HPO and LPO may cause skin sensitization.

Single exposures to HPO are only minimally irritating to eyes and skin; however, HPO may cause a photosensitization reaction. Single exposures to LPO are non-irritating to eyes but are irritating to skin. Prolonged or repeated exposures to HPO or LPO may cause severe skin irritation. Contact with the heated HPO or LPO may cause burns to eyes and skin.

Based on very limited data for HPO and LPO, and on data for the components, repeated exposure to HPO or LPO may cause damage to red blood cells (especially in susceptible individuals) if swallowed or inhaled at concentrations above the exposure limits. Oral exposure may cause cataracts. Prolonged or repeated breathing of aerosols of these products at levels above the exposure limits of the components may cause respiratory tract irritation, and damage to several organ systems (including nervous system, liver, kidneys, lung, and nasal tract; and, in the case of LPO, thymus). LPO contains minor components that cause ototoxicity in laboratory animals after repeated oral or inhalation exposure. HPO is genotoxic. LPO is not expected to cause genetic toxicity. Exposures to HPO or LPO at concentrations below the exposure limits of the components are not expected to cause reproductive or developmental toxicity. Repeated skin exposure to HPO may cause skin cancer. Inhalation and/or oral exposures to some components of HPO and LPO have been shown to cause cancer in rats and mice; however, the available information is inadequate to determine if HPO or LPO can cause cancer in animals or humans. Both occupational and non-occupational exposures to HPO and LPO are expected to be minimal and can be adequately controlled with normal industrial hygiene measures.

Environmental Information:

HPO and LPO are expected to be toxic to aquatic organisms. These products are not expected to bioconcentrate in aquatic organisms to a significant extent. The components of HPO and LPO will partition largely between the air, water, and soil compartments, with a negligible amount partitioning to sediment. Volatilization to the air can contribute to the loss of some constituents from aqueous and terrestrial habitats. Although not considered “readily biodegradable,” most components of HPO and LPO will biodegrade in water and soil over periods of weeks to months. Environmental exposures to HPO or LPO are expected to be low.

Exposure Potential:

Exposure to HPO or LPO in occupational and non-occupational settings is expected to be very limited.

- Workplace use: This refers to potential exposure to HPO or LPO to persons in a manufacturing facility or through various industrial applications. Manufacturing and transport involving HPO or LPO are usually conducted in closed systems, so

human exposure is expected to be very limited. Occupational exposure may occur during sampling, loading, unloading, or due to unexpected leakages resulting from equipment failure.

- *Consumer use*: There is no direct consumer use of HPO and LPO. Non-occupational exposure to HPO or LPO is expected to be limited to exposure following inadvertent release of the product.
- *Potential environmental release*: HPO and LPO are stored and transported in closed systems. Exposure to the environment is expected to be very low. Chevron Phillips Chemical is committed to operating in an environmentally responsible manner and has adopted the American Chemistry Council's Responsible Care® initiative.

Risk Management:

Chevron Phillips Chemical is committed to Product Stewardship and doing business responsibly. We endeavor to provide sufficient information for the safe use and handling of all our products. To that end, Safety Data Sheet and certificate of analysis are provided to customers. In addition, we have completed a product risk assessment to evaluate the potential risks associated with the distribution and use of HPO and LPO.

Regulatory Information:

Regulations exist that govern the manufacture, sale, transportation, use and/or disposal of HPO and LPO. These regulations may vary by city, state, country or geographic region. Additional helpful information may be found by consulting the relevant product Safety Data Sheet and local and Federal regulations.

Sources of Additional Information:

- Organization for Economic Cooperation and Development (OECD) - eChemPortal web-based search tool (use applicable CAS No):
<http://www.echemportal.org/echemportal>
- U.S. Environmental Protection Agency (US EPA) - High Production Volume Information System (HPVIS):
<https://ofmext.epa.gov/hpvis/HPVISlogin>
- European Chemicals Agency (ECHA) – Information on Registered Substances:
<http://echa.europa.eu/web/guest/information-on-chemicals/registered-substances>
- Chevron Phillips Chemical's olefins product website:
<http://www.cpchem.com/bl/olefins/en-us/Pages/Products.aspx>
- Chevron Phillips Chemical's Safety Data Sheets: <http://www.cpchem.com/en-us/pages/msdssearch.aspx>

Conclusion:

HPO and LPO are mainly used as fuels or for naphthalene extraction. HPO and LPO are combustible or flammable liquids and are expected to be toxic to aquatic organisms. The acute toxicity of HPO and LPO is low, but ingestion may present an aspiration hazard. HPO and LPO may cause skin sensitization. There is a potential for HPO and LPO to cause adverse health effects. Appropriate personal protective equipment practices and labeling, storage, and transportation procedures shall be followed. Further, the relevant product Safety Data Sheets and applicable regulatory guidelines and requirements, including, but

not limited to, Occupational Health and Safety Administration (OSHA) guidelines, should be consulted prior to the use or handling of HPO and LPO.

Contact Information:

<http://www.cpchem.com/>

Date: June 21, 2018