

NEODENE™ and SHOP™ LINEAR ALPHA AND INTERNAL OLEFINS Product Stewardship Summary

CAS number

Dependent upon specific product (see specific MSDS)

Generic Formula for NEODENE and SHOP linear alpha and internal olefins

C_nH_{2n}

What are NEODENE and SHOP linear alpha and internal olefins?

NEODENE and SHOP linear alpha and internal olefins (alkenes) are in the carbon range of C4 to C20+. The products available include pure 1-butene, 1-hexene and 1-octene as well as a range of blends. They are manufactured from ethylene using the Shell Higher Olefins Process (SHOP). Linear olefins are straight-chain hydrocarbon molecules containing four or more carbons with a double bond between two carbon atoms. Their vapor pressure and water solubility decrease with increasing chain length, while melting point, boiling point, and octanol: water partition coefficients increase with increasing chain length.

How are NEODENE and SHOP linear alpha and internal olefins used?

NEODENE and SHOP linear alpha and internal olefins can act as process chemicals or functional fluids. Major end-use markets include polyolefins, synthetic lubricants, oilfield chemicals, surfactants and plasticizers.

Health, Safety and Environmental considerations

Linear alpha and internal olefins are clear liquids or waxy solids at room temperature.

In general, these products show a low level of toxicity following acute oral, dermal and inhalation exposure. They are mildly to moderately irritating to the skin, considered non-irritating to the eyes and do not induce allergic reactions. As with all hydrocarbons of low viscosity, they do have the potential for producing severe, potentially fatal pneumonia (aspiration pneumonitis) if liquid is breathed into the lungs following accidental ingestion.

In repeated dose studies, the linear alpha and internal olefins have shown a low level of toxicity following exposures using the inhalation, oral and dermal routes.

These products are not neurotoxic, do not produce adverse effects on reproduction or fetal development, and are not genotoxic. They are not classified as carcinogens.

Linear alpha and internal olefins have been shown to be readily biodegradable. Although the lower carbon number linear alpha and internal olefins, in the range C12 and below, have demonstrated acute toxicity to aquatic organisms, the higher carbon number linear alpha and internal olefins are considered to be of low concern, primarily due to their poor water solubility.

In view of the volatility of the lower carbon numbers and the poor water solubility of the longer chain linear alpha and internal olefins, together with their lack of persistence, these substances are not expected to cause long-term adverse effects in the environment.

The C6, C8 and C10 linear alpha and internal olefins are flammable to highly flammable. During pumping of the products a potential exists for the accumulation of a static electric charge, further increasing the risk of fire.

Please refer to the Material Safety Data Sheet (MSDS) for complete information.

Storing and transporting linear alpha and internal olefins

Linear alpha and internal olefins are transported by road, rail and sea. Nitrogen blanketing is recommended to maintain product quality.

Risk Characterization Summary

Risks associated with exposure to these products have been evaluated for the following “chain-of-commerce” activities: manufacture, storage, product transfer, transportation, and customers/markets. They are manufactured, stored and transported to customers in closed systems. Depending on the customer, end uses may vary from use as intermediate for the manufacture other chemicals to formulation in commercial or consumer products. Proper equipment design and handling procedures maintain low risk from exposure. Exposures may be higher in commercial and consumer applications. To minimize risk, additional controls, such as, special handling procedures and protective packaging, are implemented.

This 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 health and safety information. Additional information is available through the chemical’s applicable Material Safety Data Sheet, which

should be consulted before use of the chemical. This product stewardship summary does not supplant or replace required regulatory and/or legal communication documents.