

## **XYLENES Product Stewardship Summary**

**(includes meta-xylene, ortho-xylene, para-xylene, and mixed xylenes)**

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### **Xylenes**

CAS number

1330-20-7

Chemical formula

$C_6H_4(CH_3)_2$

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### **What are xylenes?**

Xylenes are extracted or distilled from reformat, a stream derived from the refining of high-octane motor gasoline. They can also be produced from toluene using the disproportionation process. They are colourless, sweet-smelling liquids that are very flammable.

Xylenes occur as three isomers, each having two methyl groups attached to a basic benzene hydrocarbon ring. The type of isomer is distinguished by the position of the methyl groups on the ring. Para-xylene has the methyl groups attached on opposite sides of the ring, ortho-xylene has the two methyl groups next to each other, while meta-xylene has them positioned with one carbon in between the two groups. Shell chemicals companies primarily supply xylenes as a mixed stream, although various processes can be used to separate and/or convert the isomers.

### **How are xylenes used?**

Some mixed xylenes are used as solvents and in the printing, rubber, and leather industries. However, most mixed xylenes are separated and the individual isomers consumed in specific end-uses. Para-xylene is primarily used as a feedstock for terephthalic acid, a key component in polyethylene terephthalate (PET) resins. Ortho-xylene is used in plasticisers, medicines, and dyes.

Mixed xylenes are also a desirable gasoline component, but are blended less often than toluene because there is greater demand and higher value in their chemical applications.

## **Health, Safety and Environmental considerations**

Xylenes are irritating to the skin and may cause eye irritation. Inhalation of xylenes vapours in high concentrations may cause drowsiness and dizziness. If swallowed and vomited, xylene may enter the lungs and cause lung damage. Exposure to an accidental release may cause short-term effects but will not result in chronic effects. Although there is limited evidence that ethylbenzene, a component of xylene, may be a carcinogen, there is no evidence that xylenes cause cancer and the International Agency for Research on Cancer (IARC) has not classified xylenes for carcinogenic effects.

Occupational exposure limits (OELs) for xylenes have been set by most regulatory authorities and are around 100 ppm. High concentrations of xylenes vapour, well exceeding the OEL, will cause dizziness, a feeling of drunkenness and headaches. Evidence from the 1995 European Centre for Eco-toxicology and Toxicology of Chemicals Report suggests that long-term low-level exposures do not pose a health risk. Very high exposures, 20-50 times the OEL, have shown birth defects in animal studies.

Xylenes are flammable. Vapours are heavier than air. Vapours may travel across the ground and reach remote ignition sources causing a flashback fire. Electrostatic charges may be generated during pumping and may cause fire.

Xylenes are toxic to aquatic life, but in view of the high rate of loss during to evaporation, it is unlikely to pose a significant hazard. If xylenes are spilled in surface water they will float on the surface and, because of their volatility, are likely to evaporate rapidly. From air, xylenes will be naturally eliminated from the environment through rapid degradation by sunlight

## **Storage and Transport**

Xylenes should be stored in mild steel or stainless steel. Xylenes are regulated for transport as flammable liquid. Xylenes are transported via truck, rail and marine.

## **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 an intermediate for the manufacture other chemicals, commercial products, or certain formulated consumer products. Proper equipment design and handling procedures maintain low risk from exposure to xylene where the product is used as a chemical intermediate. 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.