

HYDROCARBON SOLVENTS

Hydrocarbon solvents are organic solvents, molecules of which consist only of Hydrogen and carbon atoms.

Hydrocarbon solvents are produced in form of volatile fractions in refinery of crude oil. Resulting hydrocarbon solvents contain paraffinic, naphthenic and aromatic constituents in various proportion.

- ☐ **Aliphatic solvents**
- ☐ **White spirits (mineral turpentine spirits)**
- ☐ **Aromatic solvents**
- ☐ **Properties of some hydrocarbon solvents**

Aliphatic solvents

Molecules of **aliphatic solvents** have straight-chain structure.

Hexane (C₆H₁₄), gasoline (petrol, benzine), kerosene are aliphatic solvents.

Aliphatic solvents are used in oil extraction, degreasing, for manufacturing rubber and paints, as carriers for aerosols and disinfectants.

Health effect of aliphatic solvents:

☐ **Hexane**

Short-term inhalation of hexane may cause dizziness, giddiness, nausea, and headache.

Long-term inhalation may cause muscular weakness, blurred vision headache, fatigue and even numbness.

No information about carcinogenic effect.

☐ **Gasoline**

Short-term inhalation of gasoline may result in irritating to the eyes and respiratory system, rapid onset of unconsciousness.

Prolonged skin exposure to gasoline may cause dermatitis, neurological disorders.

No reliable evidences of carcinogenic effect.

☐ **Kerosene**

Exposure to kerosene may cause irritating to eyes and skin, lung injury, dermatitis, irritability, restlessness, drowsiness, convulsions, coma and even death.

Kerosene is not considered to be carcinogenic to humans.

White spirits (mineral turpentine spirits)

White spirit is a mixture of aromatic and paraffinic hydrocarbons.

White spirits have boiling ranges (temperatures at which they start and finish boiling) 300°F - 430°F (150°C - 220°C).

White spirits are used as solvents or diluents in thinners for paints and varnishes, paint driers, color printing of fabrics, coal benification, for metal cleaning and degreasing, in furniture and rubber industry,

for waxes and polishes, in dry cleaning.

Health effect of white spirits:

Short-term exposure to white spirits may cause irritation of the respiratory tract, skin and eyes irritation, dizziness and euphoria leading to unconsciousness in severe cases.

Long-term inhalation may result in central nervous system complications, blood changes (aplastic anemia, a rare occurrence that is potentially fatal) and dermatitis.

No data has been reported concerning the carcinogenic effect of white spirit.

Aromatic solvents

Molecules of pure **aromatic solvents** have benzene ring structure. Examples of pure aromatic solvents are benzene (C_6H_6), toluene ($C_6H_5CH_3$) and xylene (C_8H_{10}).

Pure (high) aromatic solvents are used for degreasing, as thinners, for manufacturing paints, printing inks, insecticides and agricultural chemicals.

Health effect of aromatic solvents:

Benzene

Short-term inhalation of benzene may cause drowsiness, dizziness, headaches, as well as eye, skin, and respiratory tract irritation, and, at high levels, unconsciousness.

Long-term inhalation may cause disorders in the blood, including reduced numbers of red blood cells and aplastic anemia.

Benzene is carcinogen (Group A).

Toluene

Short-term inhalation of toluene may cause dysfunction of the central nervous system: fatigue, sleepiness, headaches, and nausea.

Short-term inhalation results in irritation of the upper respiratory tract and eyes, sore throat, dizziness, and headache.

Not classified as carcinogen.

Xylene

Short-term inhalation of xylene results in irritation of the eyes, nose, and throat, gastrointestinal effects, eye irritation, and neurological effects.

Long-term inhalation of xylene may cause dysfunction of the central nervous system (CNS), such as headache, dizziness, fatigue, tremors, and incoordination; respiratory, cardiovascular, and kidney effects have also been reported.

Not classified as carcinogen.

Properties of some hydrocarbon solvents

(Materials Data)

Hexane

Gasoline

- ▣ Kerosene
- ▣ White spirit
- ▣ Benzene
- ▣ Toluene
- ▣ Xylene

Source : http://www.substech.com/dokuwiki/doku.php?id=hydrocarbon_solvents