

Description

Tetrahydrofuran (THF) is a clear, colorless, low viscosity liquid with an ether-like odor. THF exhibits high volatility and an extremely low freezing point. At 20°C, THF is completely miscible with H₂O.

Typical Properties

Specific Gravity (20/4°C)	0.886-0.889
Boiling Point (760 TORR)	66°C
Freezing Point	-108.5°C
Flash Point (TCC)	-14°C
Color, APHA	20 maximum
Suspended Matter	Nil
Inhibitor Level	100 - 400 ppm

THF is a versatile solvent with numerous industrial applications. Due to its tendency to form peroxides on storage, THF is inhibited with BHT.

THF is produced by the cyclodehydration of 1,4-BDO. Lyondell Chemical Company produces 1,4-BDO in a proprietary process starting with allyl alcohol.

Applications

Polytetramethylene Ether Glycol (PTMEG). THF is polymerized under strongly acidic conditions to form PTMEG which is used extensively to manufacture urethane elastomers and fibers. PTMEG provides exceptional flexibility and elasticity to such products. In particular, PTMEG based urethanes are noted for their good flex properties at low temperature and their hydrolytic resistance.

Magnetic Tape. Solvents are needed to dissolve the raw binder polymers and to provide a fluid medium for the pigment dispersion in the magnetic tape paint. THF, with its high purity, excellent solvency power and favorable conductivity value, is fast becoming the solvent of choice.

Adhesives. THF solvents can be used to join rigid plastic pipe and in compounded cements for leather, plastic sheet film extrusions and for molded plastic parts assemblies. The combined advantages of rapid solvent activity, minimum gelation and lower relative viscosities for resin solutions, makes THF an attractive solvent choice.

PVC Cements. THF-PVC formulations meet NSF standards. THF solvent cements can be formulated with additional solvents and inorganic fillers to control set time. THF can also function as a PVC-type cleaner before joint formation.

Vinyl Films and Cellophane. THF is a superb solvent for many chlorinated resins which find utility in film formation applications such as vinyl topcoating, cast vinyl films, and coated cellophane. Such applications rely on the ability of THF to solvate the polymeric resins without excessive viscosity build up. In addition, the high volatility of THF is essential in these applications because of the need to remove the solvent completely with minimal energy input.

Pharmaceutical Solvent Applications. THF is frequently utilized as a solvent in many pharmaceutical synthetic procedures because of its broad solvency for polar and non-polar compounds. THF is particularly capable of dissolving many ionic species and organometallics which are commonly used in specialty syntheses. In many cases, THF makes higher yields and faster reaction rates possible. In addition, THF's high volatility and very high purity facilitate solvent removal and recovery without leaving residues in the desired product.

Reaction Solvent. THF is stable under very strongly basic conditions and is therefore the choice for numerous specialty syntheses which involve complex catalysts and

Grignard reagents. Also, THF is a preferred solvent for anionic polymerization.

Miscellaneous Solvent Applications. THF is used in very large quantities in research institutions worldwide as a solvent for numerous chromatographic techniques such as Gel Phase Chromatography. Its broad solvency capabilities are consistently reliable. Other examples of its utilization as a solvent are:

- Natural Products
- Industrial Resins
- Elastomers
- Polyurethane Coatings
- Printing Inks

Storage and Handling

THF has a flammable DOT hazard class. As a result, heat, sparks, open flames, open containers and poor ventilation are conditions to be avoided. Materials to avoid include oxidizing agents and strong acids and bases. Care should be taken to store THF under cool, dry conditions due to its volatile and flammable nature. While THF as supplied contains an inhibitor, heat sensitive peroxides can form if stored for long periods of time. Explosions have been known to occur when uninhibited THF was heated.

Toxicological Evaluation

Exposures at or below the ACGIH TLV of 200 ppm should prevent any health hazard.

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Users should review the applicable Safety Data Sheet before handling the product.

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