

74I-0794-00941

A

Chemical: 1,2,3,4-Tetrahydronaphthalene, CAS #119-64-2

Du Pont Trade Name: "Tetralin" solvent

Manufacture:

Deleted

Confidential
Business
Information

Prime Application: Industrial solvent for oils, resins, waxes, rubber and asphalt

Environmental Release:

- 5 lbs/yr to atmosphere
- 250 lbs/yr to plant wastewater treatment facility.



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Worker Exposure: Total number of workers exposed = 15, (Operations 12, Maintenance 3).

Exposure Level: $<0.03 \text{ mg/m}^3$, 8-hr TWA (estimated)

Exposure Duration: Operators - 9 days/yr, Maintenance Personnel - 3 days/yr

Exposure Control:

- Nomex outerwear, Neoprene gloves and side-shield glasses worn routinely.
- Butyl rubber gloves, boots, apron or full suit, face shield and respiratory protection (cartridge respirator or airline mask) required for operations having high exposure potential.



FYI-94-000941
INIT 07/26/94

Attachments:

- Du Pont Haskell Laboratory Toxicity Summary
- Material Safety Data Sheet
- Product Technical Bulletin

KDDASTUR
1/30/84

9/25/95

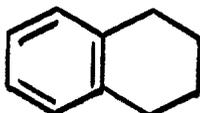


LIMITED DISTRIBUTION

This review reflects the available toxicity literature, both published and unpublished. Studies have not been evaluated for scientific merit.

HASKELL LABORATORY

Common Name: Tetralin
Chemical Name: Naphthalene, 1,2,3,4-tetrahydro- (9CI)
Synonyms: Tetrahydronaphthalene
Benzocyclohexane
CAS Registry No.: 119-64-2
Structure:



Physical and Chemical Properties (1)

Boiling Point: 207.2°C
Melting Point: -30°C
Vapor Pressure: 1 mm Hg @ 38°C
Vapor Density (air=1): 4.6
Specific Gravity (liquid): 0.971
Flash Point: 171°F
Solubility: Insoluble in water
Very soluble in ethanol and ether
Conversion Factors: 1 ppm = 5.41 mg/m³
1 mg/l = 183 ppm (0 STP)

Threshold Limit Value

None

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TOXICITY

A. Acute

1. Oral

- LD50 (rat) = 2860 mg/kg (2).
- Tetralin may be fed in doses of 5-6 g to rabbits weighing 2 kg without any noticeable effects (3).
- Rabbits die from the administration of 5-6 g tetralin, narcosis first resulting (10).
- High doses of tetralin given by mouth to experimental animals have caused damage to the liver and kidney (4).

2. Eye

- 0.5 ml of undiluted tetralin gave an injury to rabbit eyes of 0-1.0 points (on a scale of 10) (2).

3. Skin

- LD50 (rabbit) = 16.8 g/kg (2).
- LD50 (rabbit) = 17 g/kg (5).
- 500 mg of tetralin caused severe irritation when applied to rabbit skin in an open irritancy test (5).
- Tetralin caused slight erythema when applied to the skin of rabbits (2).

4. Inhalation

- When rats were exposed to saturated vapors of tetralin, 8 hours was the maximum exposure time that caused no deaths (2).
- Tetralin was administered to mice on a mask to test its narcotic effect. Even when soaked, the mask produced only semi-narcosis after an initial short period of excitation, unless the mask was heated to increase the vapor (6).

5. Injection

- Intraperitoneal injections of tetralin produced narcosis in rabbits, and ebriety followed by narcosis in guinea pigs (7,8).
- Kanitz, et al (1934) found no albuminuria in any of their animals by subcutaneous or intravenous administration, and the only histological evidence of injury to the kidneys consisted of slight swelling and some yellow pigmentation of the peripheral layers (9).

B. Repeated Exposure

1. Oral

- Guinea pigs were given 0.25 ml daily (240 mg). After a week of well-being, restlessness or apathy, roughening of the skin, anorexia and intense diarrhea was seen. The urine became scanty and greenish-brown tinged (11).
- Following oral administration, definite signs of cataract were observed in rabbits (18). Others, however, were unable to produce cataracts in rats fed a diet containing 2% tetralin for 2 months (19).

2. Inhalation

- In guinea pigs who were exposed daily for 30 minutes to tetralin, very definite symptoms of cataract have appeared in 6 days. The kidneys showed some epithelial nephritis (12).
- The most extensive repeated inhalation studies have been conducted by Cardani with guinea pigs. These animals were exposed to about 275 ppm tetralin, 8 hours a day, for approximately 3 weeks. The principal positive pathological findings were severe changes in the kidney and liver and chemical pneumonitis. No significant deviations were found in the peripheral blood (11).

3. Skin

- Guinea pigs had tetralin applied to their shaved skin daily. Eczema developed (11).

Route Unknown

- Tetralin has been found to cause methaemoglobin formation in cats (17).

C. Carcinogenicity, Mutagenicity, Teratogenicity

No information found.

D. Human Exposure

- Individuals exposed to tetralin vapors have complained of headache, malaise, and irritation of the eyes, throat, and mucous membranes of the nasal passages (4,12,14,20-24). Severe exposure has resulted in the elimination of a green-colored urine in man (4,12,14,23-25).
- Tetralin can act as a defatting agent and can dissolve fat from the skin. As a result, eczema is occasionally observed (15). Dermatitis has also been reported in painters working with tetralin (14).
- A worker accidentally sprayed with tetralin had some eye inflammation, but was "all right" in a few days (16).
- A patient ingested about 250 ml of Cuprex, an ectoparasiticide containing tetralin, copper, oleate, paraffin oil, and acetone, in an episode of self-poisoning. This caused a mild degree of liver and kidney damage that subsided within two weeks. The main urinary metabolite of tetralin was 1,2,3,4-tetrahydro-1-naphthol (33).

E. Metabolism

- When tetralin is fed to rabbits (600 mg/kg), 56% is excreted as glucuronides and 12% as ethereal sulfate. Tetralin is metabolized in the rabbit mainly by oxidation (26).

- Tetralin-1-¹⁴C was synthesized and fed to rabbits. Of the radioactivity, 87-90% was excreted in the urine within 2 days and 0.5-3.7% on the 3rd day. The feces contained 0.6-1.8%. No radioactivity was found in the breath and negligible amounts were retained in the tissues. About 90-99% of the dose was accounted for. The main metabolite was the glucuronide of α -tetralol (52.4%) (27).
- Tetralin is excreted as tetralin-glucuronic acid by rabbits (10,28).
- Dogs given tetralin destroyed it in part and excreted 30% as tetrahydronaphthol (29).
- The ingestion of tetralin leads to a rapid sinking of body temperature followed soon after a slow and more prolonged rise of temperature above normal (30).
- Older literature on the metabolism of tetralin has been summarized by Browning (1965) (1).

F. Miscellaneous

- Tetralin was highly toxic to Ehrlich-Landschütz diploid ascites tumor cells during short-term in vitro incubations (31).
- Tetralin gave a 100% knockdown of houseflies when 0.0002 cc was applied to their abdomens (32).

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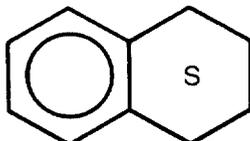
Linda J. Ver Nooy:md
March 15, 1979

Linda J. Ver Nooy

TETRALIN® Solvent (1,2,3,4-Tetrahydronaphthalene) C₁₀ H₁₂

DATA SHEET

CAS Reg. No. 119-64-2



TETRALIN* Solvent is a product of the partial hydrogenation of naphthalene. It is a colorless to pale yellow liquid. It is used as a solvent for oils, resins, waxes, rubber and asphalt.

SPECIFICATIONS (8-T-1)

Clear, colorless to pale yellow liquid with a light transmission @ 400 nm in a 10 mm cell @ 25 C, min %	78
Tetrahydronaphthalene, %, min	97.0
Decahydronaphthalene, %, max	2.0
Naphthalene, %, max	1.0
Free water, visual inspection	none

TYPICAL PHYSICAL PROPERTIES†

Molecular weight	132.2
Boiling point (760 mm Hg), C	207
F	405
Freezing point, C	-31
F	-24
Specific gravity (20 C)	0.970
Density, lb/gal (20 C)	8.1
Vapor pressure, mm hg @ 100 C	27
@ 160 C	221
Solubility in water	negligible
Flash point, TCC, C	82
F	180

* Reg. U.S. Pat. & Tm. Off., Du Pont Co.

† These properties are drawn from various Du Pont and other literature sources. Du Pont does not make any express or implied warranty that the commercial product will have these typical properties.

PERSONAL SAFETY AND FIRST AID

Health Hazards

On a one-time exposure, TETRALIN® Solvent may produce mild irritation to the skin and eyes. Its LD50 when administered orally to rats is 2860 mg/kg. The LD50 on rabbit skin is 17 000 mg/kg.

On repeated exposure, TETRALIN is more hazardous. It can defat the skin and cause cracking and may lead to secondary infection. In animal experiments, repeated oral or inhalation exposures caused liver and kidney damage and cataract formation.

Safety Precautions

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles and rubber gloves. Avoid breathing vapor and use with adequate ventilation. Wash thoroughly after handling.

First Aid

In case of contact with the eyes, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician. Wash skin with plenty of soap and water. Wash contaminated clothing before reuse.

STORAGE AND HANDLING

TETRALIN is stored and transferred in steel equipment. Its low freezing point of -31 C (-24 F) permits storage and handling without heat or insulation. TETRALIN is combustible and is thermally stable.

TETRALIN should be handled in closed equipment where possible or in work areas provided with good ventilation by trained personnel. See PERSONAL SAFETY AND FIRST AID. Where contact with the product cannot be avoided, suitable personal protective equipment must be worn. In the event of a spill or leak of

NOTICE: MAY CAUSE IRRITATION TO SKIN AND EYES. COMBUSTIBLE. MAY FORM EXPLOSIVE PEROXIDES. See Personal Safety and First Aid.

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MATERIAL SAFETY DATA SHEET

IDENTIFICATION

Name

Decalin® and Tetralin® Solvents

Grade

Synonyms Decalin®: Decahydronaphthalene

Tetralin®: 1,2,3,4-Tetrahydronaphthalene

CAS Name

	Decalin®	Tetralin®
I.D. Nos./Codes	DuPont: 19240	953400
	NIOSH: QJ3150000	QK3850000
Manufacturer/Distributor	Wiswesser: L66TJ	L66&TJ

E. I. du Pont de Nemours & Co. (Inc.)

Address

Wilmington, DE 19898

PHYSICAL DATA

Boiling Point, 760 mm Hg

Decalin®: 187° C (369° F)

Tetralin®: 207° C (405° F)

Specific Gravity

Decalin® = 0.876

Tetralin® = 0.970

Vapor Density Decalin® = 4.76 (Air=1)

Tetralin® = 4.55

% Volatiles by Vol.

100%

Form

Liquid

Appearance

Clear

pH Information

Not relevant

HAZARDOUS COMPONENTS

Material(s)

Decalin®

Tetralin®

Chemical Family

Cyclic hydrocarbon

Formula Decalin®: C₁₀H₁₈

Tetralin®: C₁₀H₁₂

CAS Registry No. Decalin®: 91-17-8

Tetralin®: 119-64-2

Du Pont Registry No.

Product Information and Emergency Phone

(302) 774-2421

Transportation Emergency Phone

(800) 424-9300

Freezing Point:

Decalin®: -45° C (-49° F)

Tetralin®: -30° C (-22° F)

Vapor Pressure

Decalin®: 41.5 mmHg @ 92° C (198° F)

Tetralin®: 1 mmHg @ 38° C (100° F)

Solubility in H₂O Negligible

Evaporation Rate (Butyl Acetate = 1)

< 1

Color Colorless to

pale yellow

Odor

Hydrocarbon

Octanol/Water Partition Coefficient

Approximate %

97% (plus 3% Tetralin®)

97% (plus 2% Decalin®; 1% Naphthalene)

HAZARDOUS REACTIVITY

Instability Stable at temperatures and conditions normally encountered in storage.

Potentially explosive peroxides can form on long time storage in contact with air.

Light and heat accelerate peroxide formation. See Du Pont Data Sheets on Decalin®/Tetralin®

Incompatibility

Incompatible with oxidizing materials.

Decomposition

Will not occur at temperatures less than 290° C (555° F)

Polymerization

Will not occur.

E-52973

Date: 2/83

PROTECTION INFORMATION

Ventilation

Decalin® and Tetralin® should be handled in closed equipment wherever possible, and good ventilation should be provided in storage and use areas.

Personal Protective Equipment

Wear the following equipment, as appropriate, to prevent skin or eye contact: Chemical splash goggles, safety glasses, hard hat with brim and Neoprene gloves. If direct exposure is likely, wear a chemical-proof suit with hood and breathing air supply.

Other

DISPOSAL INFORMATION

Aquatic Toxicity

TLm 96: Decalin® = 1000-100 ppm; Tetralin® = 100-10 ppm

Spill, Leak or Release Evacuate area and keep upwind of spill. Contain spill with sand or earth dam, soak up with sand or other noncombustible absorbant and transfer to a covered metal container for disposal. Flush area with soap and water. Comply with Federal, State, and local regulations on reporting releases.

Waste Disposal

Comply with Federal, State, and local regulations. If approved, may be incinerated or transferred to a disposal contractor. Very dilute solutions are biodegradable by specially acclimated bacteria.

SHIPPING INFORMATION

Transportation

DOT Hazard Class.*: Combustible Liquid. (Not regulated in containers less than 110 gallons)

IMCO Class.: 3.3 (Decalin®)

DOT Shipping Name*: Decalin® - Decahydronaphthalene
Tetralin® - Combustible Liquid N.O.S.

UN No.: Decalin® - 1147

NA No.: Tetralin® - 1993

RQ Quantity*: Not applicable.

*49 CFR 172.101

Shipping Containers

Tank trucks, drums

Storage Conditions

Store in a well-ventilated area away from heat, sparks, or flame. Do not store with strong oxidizing materials. Keep containers tightly closed.