

SAFETY DATA SHEET

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Preparation Date: 01/01/2019

Revision Date: N/A

Revision Number: N/A

1. IDENTIFICATION

Product identifier

C5940 Product code: **Product Name:** PENTANE, REAGENT

Other means of identification

Synonyms: CAS #: **RTECS #** CI#:

Amyl hydride 109-66-0 RZ9450000 Not available

Recommended use of the chemical and restrictions on use

Recommended use:	Solvent.
Uses advised against	No information available

Dawn Scientific Inc Supplier:

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Emergency telephone number Chemtrec 1-800-424-9300

2. HAZARDS IDENTIFICATION

Classification

This chemical is considered hazardous according to the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Considered a dangerous substance or mixture according to the Globally Harmonized System (GHS)

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2B
Specific target organ toxicity (single exposure)	Category 3
Aspiration toxicity	Category 1
Flammable liquids	Category 2

Label elements

Danger

Hazard statements Causes skin irritation Causes eye irritation May cause respiratory irritation. May cause drowsiness or dizziness May be fatal if swallowed and enters airways Highly flammable liquid and vapor



Hazards not otherwise classified (HNOC) Not Applicable

Other hazards

May be harmful in contact with skin

Precautionary Statements - Prevention

Avoid breathing dust/fume/gas/mist/vapors/spray Use only outdoors or in a well-ventilated area Wash face, hands and any exposed skin thoroughly after handling Keep away from heat/sparks/open flames/hot surfaces. — No smoking Keep container tightly closed Ground/bond container and receiving equipment Use explosion-proof electrical/ventilating/lighting/.../equipment Use only non-sparking tools Take precautionary measures against static discharge Keep cool Wear protective gloves Wear eye/face protection

Precautionary Statements - Response

In case of fire: Use CO2, dry chemical, or foam to extinguish.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

If skin irritation occurs: Get medical advice/attention

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower

Wash contaminated clothing before reuse

IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.

IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician

Do NOT induce vomiting

Precautionary Statements - Storage

Store locked up Store in a well-ventilated place. Keep container tightly closed

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No.	Weight %
Pentane	109-66-0	100

4. FIRST AID MEASURES

First aid measures

General Advice:

National Capital Poison Center in the United States can provide assistance if you have a poison emergency and need to talk to a poison specialist. Call 1-800-222-1222.

Skin Contact:	Wash off immediately with soap and plenty of water removing all contaminated clothing and shoes. Get medical attention. If skin irritation persists, call a physician.
Eye Contact:	Flush eyes with water for 15 minutes. Get medical attention.
Inhalation:	Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.
Ingestion:	Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Consult a physician if necessary.

Most important symptoms and effects, both acute and delayed

Symptoms

Aspiration hazard if swallowed - can enter the lungs and cause damage May be fatal if swallowed and enters airways Causes skin irritation Causes eye irritation Central nervous system effects Inhalation of high concentations may cause anesthetic effects May cause drowsiness or dizziness Lightheadedness Ataxia Somnolence Fainting Convulsions Confusion May cause digestive (gastrointestinal) tract irritation May cause nausea and vomiting It may affect the kidneys May cause headache Paresthesia (numbness and tingling of the extremities)

Indication of any immediate medical attention and special treatment needed

Notes to Physician: Treat symptomatically.

Protection of first-aiders

First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste.

5. FIRE-FIGHTING MEASURES

Extingu	ishing	Media	
Suitable	Exting	uishing	Media:

Carbon dioxide (CO2). Dry chemical. Water spray mist or foam.

Unsuitable Extinguishing Media:

Do not use a solid (straight) water stream as it may scatter and spread fire.

Specific hazards arising from the chemical

Hazardous Combustion Products:

Specific hazards:

Carbon Monoxide, Carbon Dioxide.

Highly flammable. May be ignited by heat, sparks or flames. Container explosion may occur under fire conditions or when heated. Vapor may travel considerable distance to source of ignition and flash back. Vapors may form explosive mixtures with air. Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks). Fire may produce irritating, corrosive and/or toxic gases.

Special Protective Actions for Firefighters

Specific Methods:

Water mist may be used to cool closed containers. For larger fires, use water spray or fog. Cool containers with flooding quantities of water until well after fire is out.

Special Protective Equipment for Firefighters:

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions:	Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Avoid contact with skin, eyes and clothing. Use personal protective equipment. Remove all sources of ignition. Pay attention to flashback. All equipment used when handling the product must be grounded. Use spark-proof tools and explosion-proof equipment. In case of large spill, water spray or vapor suppressing foam may be used to reduce vapors, but may not prevent ignition in closed spaces.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Do not let this chemical enter the environment. Prevent entry into waterways, sewers, basements or confined areas. In case of large spill, dike if needed. Dike far ahead of liquid spill for later disposal.
Methods and material for contai	nment and cleaning up
Methods for containment	Stop leak if you can do it without risk. Absorb spill with inert material (e.g. vermiculite, dry sand or earth). In case of large spill, dike if needed. Dike far ahead of liquid spill for later disposal.
Methods for cleaning up	Use appropriate tools to put the spilled material in a suitable chemical waste disposal container. Use only non-sparking tools. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Precautions for safe handling

Technical Measures/Precautions:

Provide sufficient air exchange and/or exhaust in work rooms. Remove all sources of ignition. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Keep away from incompatible materials.

Safe Handling Advice

Wear personal protective equipment. Use only in well-ventilated areas. Avoid contact with skin, eyes and clothing. Keep away from heat and sources of ignition. Take precautionary measures against static discharges. Do not breathe vapors or spray mist. Do not ingest. When using do not smoke. Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Technical Measures/Storage Conditions:

Keep containers tightly closed in a cool, well-ventilated place. Keep away from heat and sources of ignition. Keep refrigerated. Store at 2-8 deg. C. Store in a segregated and approved area. Store away from incompatible materials.

Incompatible Materials:

Strong oxidizing agents

Chlorine Bromine Fluorine Strong acids Strong bases

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

National occupational exposure limits

United States

Components	CAS-No.	OSHA	NIOSH	ACGIH	AIHA WEEL
Pentane	109-66-0	1000 ppm TWA 2950 mg/m³ TWA	120 ppm TWA 350 mg/m³ TWA 610 ppm Ceiling 15 min	1000 ppm TWA	None
			1800 mg/m ³ Ceiling 15 min		

Canada

Components	CAS-No.	Canada - Alberta	Canada - British Columbia	Canada - Ontario	Canada - Quebec
Pentane	109-66-0	600 ppm TWA 1770 mg/m³ TWA	600 ppm TWA	600 ppm TWA	120 ppm TWAEV 350 mg/m ³ TWAEV

Australia and Mexico

Components	CAS-No.	Australia	Mexico
Pentane	109-66-0	750 ppm STEL	600 ppm TWA
		2210 mg/m ³ STEL	1800 mg/m ³ TWA
		_	760 ppm STEL
			2250 mg/m ³ STEL
		600 ppm TWA	-
		1770 mg/m ³ TWA	

Appropriate engineering controls

Engineering measures to reduce exposure:

Ensure adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors and mist below their respective threshold limit value.

Individual protection measures, such as personal protective equipment

Personal Protective Equipment

Eye protection:	Goggles
Skin and body protection:	Chemical resistant apron Long sleeved clothing Gloves
Respiratory protection:	Vapor respirator. Be sure to use an approved/certified respirator or equivalent.
Hygiene measures:	Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Liquid

Odor: Mild. Sweet.

Molecular/Formula weight: 72.15

Flash Point Tested according to: Closed cup

Upper Explosion Limit (%): 7.8%

Boiling point/range(°C/°F): 36.1 °C/97 °F

Specific gravity: 0.6262

Evaporation rate: No information available

Odor threshold (ppm): 0.0066-3.0

Miscibility:

Miscible with Ethanol Miscible with Ether Miscible with Acetone Miscible with Benzene Miscible with Carbon tetrachloride Appearance: Clear.

Taste No information available.

Flammability: Highly flammable

Autoignition Temperature (°C/°F): 260 °C/500 °F

Melting point/range(°C/°F): -130 °C/-202 °F

Bulk density: No information available

pH: No information available

Vapor density: 2.49

Partition coefficient (n-octanol/water): log Kow = 3.39

Solubility: Insoluble in water Soluble in carbon tetrachloride Color: Colorless.

Formula: C5-H12

Flashpoint (°C/°F): -49 °C/ -56.2 °F

Lower Explosion Limit (%): 1.5%

Decomposition temperature(°C/°F): No information available

Density (g/cm3): No information available

Vapor pressure @ 20°C (kPa): 5.8

VOC content (g/L): 626

Viscosity: No information available

10. STABILITY AND REACTIVITY

Reactivity It can react vigorously, violently or explosively with oxidizers

Chemical stability

Stability:	Stable under recommended storage conditions.
Possibility of Hazardous Reactions	: Hazardous polymerization does not occur
Conditions to avoid:	Heat. Ignition sources. Incompatible materials.
Incompatible Materials:	Strong oxidizing agents Chlorine Bromine Fluorine Strong acids Strong bases
Hazardous decomposition products:	Carbon monoxide. Carbon dioxide. When heated to decomposition it emits acrid smoke and irritating fumes.

Other Information Corrosivity:

No information available

Special Remarks on Corrosivity: No information available

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Principal Routes of Exposure: Ingestion. Skin. Inhalation.

Acute Toxicity

Component Information

Pentane 109-66-0 CAS-No. LD50/oral/rat = > 2000 mg/kg Oral LD50 Rat LD50/oral/mouse = 5000 mg/kg LD50/dermal/rabbit = 3000 mg/kg Dermal LD50Rabbit LD50/dermal/rat = No information available LC50/inhalation/rat = 364 g/m³ Inhalation LC50 Rat 4 h LC50/inhalation/mouse = No information available Other LD50 or LC50information = No information available **Product Information** LD50/oral/rat = VALUE- Acute Tox Oral = > 2000 mg/kg LD50/oral/mouse = Value - Acute Tox Oral = 5000 mg/kg LD50/dermal/rabbit VALUE-Acute Tox Dermal = 3000 mg/kg LD50/dermal/rat **VALUE -Acute Tox Dermal =** No information available LC50/inhalation/rat **VALUE-Vapor =** 364 g/m^3 (4-hr) VALUE-Gas = No information available VALUE-Dust/Mist = No information available LC50/Inhalation/mouse VALUE-Vapor = No information available VALUE - Gas = No information available VALUE - Dust/Mist = No information available

Symptoms

Skin Contact:	Causes skin irritation. Symptoms may include redness, increased blood flow, swelling, burning sensation, itching, pigmentation, followed by blister formation. It may be absorbed through the skin.
Eye Contact:	Causes eye irritation.

Inhalation	Irritating to respiratory system. It is a mild respiratory tract (nose, throat, lungs) irritant causing coughing, wheezing, and/or shortness of breath. Inhalation exposure to an airborne concentration of 5,000 ppm for 10 minutes appears to have no ill effect in humans, while 90,000 to 120,000 ppm can affect behavior/central nervous system and cause symptoms of central nervous system depression and narcosis. Symptoms may include nausea, headache, weakness, dizziness, excitement, confusion, lightheadedness, sleepiness or drowsiness, fatigue, seizures, inability to concentrate, loss of coordination and judgement, unconsciousness, coma, and possible death with exposure to large amounts. Airborne concentration of approximately 130,000 ppm can be fatal by asphyxiation.
Ingestion	Causes digestive (gastrointestinal) tract irritation. Ingestion may cause nausea, vomiting. Aspiration hazard if swallowed. Aspiration into the lungs can cause chemical pneumonitis. Aspiration may lead to pulmonary edema. May cause central nervous system effects (affect behavior).
Aspiration hazard	May be fatal if swallowed and enters airways.
Delayed and immediate effects	as well as chronic effects from short and long-term exposure
Chronic Toxicity	Prolonged skin contact may cause drying and cracking of the skin. Chronic exposure may affect the peripheral nervous system (peripheral neuropathy with muscle weakness, paresthesia - a sensation of tingling, pricking, or numbness of the skin (known as the feeling of "pins and needles) generally of the hands and feet (extremities). Prolonged or repeated ingestion may affect the kidneys. Chronic exposure may cause central nervous system effects. Prolonged or repeated inhalation may cause bronchitis with coughing, phlegm, and/or shortness of breath. Chronic exposure can result in anoxia or severe hypoxia.
Sensitization:	No information available.
Mutagenic Effects:	No information available

Carcinogenic effects: Not considered carcinogenic.

Components	CAS-No.	IARC	ACGIH - Carcinogens	NTP	OSHA HCS - Carcinogens	Australia - Notifiable Carcinogenic Substances	Australia - Prohibited Carcinogenic Substances
Pentane	109-66-0	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed

ACGIH (American Conference of Governmental Industrial Hygienists)

IARC (International Agency for Research on Cancer)

NTP (National Toxicology Program)

OSHA (Occupational Safety and Health Administration of the US Department of Labor)

Reproductive toxicity	No data is available
Reproductive Effects: Developmental Effects:	No information available No information available
Teratogenic Effects:	No information available

Specific Target Organ Toxicity

STOT - single exposure	central nervous system. Respiratory system.
STOT - repeated exposure	No information available.
Target Organs:	Central nervous system. Peripheral nervous system. Skin.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects:	Aquatic environment.
Pentane - 109-66-0 Freshwater Fish Species Data: Water Flea Data:	9.87 mg/L LC50 Oncorhynchus mykiss 96 h 1 11.59 mg/L LC50 Pimephales promelas 96 h 1 9.99 mg/L LC50 Lepomis macrochirus 96 h 1 9.74 mg/L EC50 Daphnia magna 48 h
Persistence and degradability:	No information available
Bioaccumulative potential:	Potential for bioconcentration in aquatic organisms is moderate.
Mobility:	It is expected to have high mobility in soil.

13. DISPOSAL CONSIDERATIONS

Disposal Methods

Waste from residues / unused products:

Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:

Empty containers should be taken for local recycling, recovery or waste disposal

Components	CAS-No.	RCRA - F Series Wastes	RCRA - K Series Wastes	RCRA - P Series Wastes	RCRA - U Series Wastes
Pentane	109-66-0	None	None	None	None

14. TRANSPORT INFORMATION

UN1265
Pentanes
3
No information available
II
128
Severe Marine Pollutant
No information available
IB2, IP8, T4, TP1
No information available
UN1265, Pentanes, 3, II
UN1265
Pentanes
3
No information available
II
No Information available
UN1265, Pentanes, 3, II

ADR UN-No: Proper Shipping Name: Hazard Class: Packing Group: Subsidiary Risk: Description:	UN1265 Pentanes 3 II No information available UN1265, Pentanes, 3, II, ENVIRONMENTALLY HAZARDOUS
IMO / IMDG UN-No: Proper Shipping Name: Hazard Class: Subsidiary Risk: Packing Group: Marine Pollutant EMS: Description	UN1265 Pentanes 3 No information available II No information available F-E UN1265, Pentanes, 3, II, Marine pollutant
RID UN-No: Proper Shipping Name: Hazard Class: Subsidiary Risk: Packing Group: Description:	UN1265 Pentanes 3 No information available II UN1265, Pentanes, 3, II, ENVIRONMENTALLY HAZARDOUS
ICAO UN-No: Proper Shipping Name: Hazard Class: Subsidiary Risk: Packing Group: Description:	UN1265 Pentanes 3 No information available II UN1265, Pentanes, 3, II
IATA UN-No: Proper Shipping Name: Hazard Class: Subsidiary Risk: Packing Group: ERG Code: Special Provisions Description:	UN1265 Pentanes 3 No information available II 3H No information available UN1265, Pentanes, 3, II

15. REGULATORY INFORMATION

International Inventories

Components	CAS-No.	U.S. TSCA	KOREA KECL	Philippines (PICCS)	Japan ENCS	CHINA	Australia (AICS)	EINECS-No.
Pentane	109-66-0	Present	Present KE-27968	Present	Present (2)-5	Present	Present	Present 203-692-4

U.S. Regulations

Pentane

Massachusetts RTK: Present New Jersey RTK Hazardous Substance List: 1476 New Jersey (EHS) List: 1476 500 lb TPQ New Jersey - Discharge Prevention - List of Hazardous Substances: Present New Jersey TCPA - EHS: 10000bTQ Pennsylvania RTK: Present Minnesota - Hazardous Substance List: Present California Directors List of Hazardous Substances: Present

California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.

Chemicals Known to the State of California to Cause Cancer:

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Components	CAS-No.	Carcinogen	Developmental Toxicity	Male	Female
				Reproductive	Reproductive
				Toxicity	Toxicity:
Pentane	109-66-0	Not Listed	Not Listed	Not Listed	Not Listed

CERCLA/SARA

Components	CAS-No.	CERCLA - Hazardous Substances and their Reportable Quantities	Section 302 Extremely Hazardous Substances and TPQs	Section 302 Extremely Hazardous Substances and RQs	Section 313 - Chemical Category	Section 313 - Reporting de minimis
Pentane	109-66-0	None	None	None	None	None

U.S. TSCA

Components		TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)	TSCA 8(d) -Health and Safety Reporting
Pentane	109-66-0	Not Applicable	01/26/199406/30/1998

Canada

WHIMIS 2015 - GHS Classifications

WHMIS 2015 Hazard Classification Information:

ComponentWHMIS 2015 Hazard ClassificationPentaneFlammable liquids - Category 2: H225 Highly flammable liquid and109-66-0 (100)vapour.; Aspiration hazard - Category 1: H304 May be fatal if
swallowed and enters airways.

Canada Hazardous Products Regulation This product has been classified according to the hazard criteria of the HPR (Hazardous Products Regulation) and the SDS contains all of the information required by the HPR

WHMIS 1988 Hazard Class

B2 Flammable liquid

Components Pentane

Canada Controlled Products Regulation:

This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

Components	WHMIS Ingredient Disclosure List -
Pentane	1 %

WHMIS 1988

B2

Inventory

Components	CAS-No.	Ca	inada (DSL)	C	Canada (NDSL)
Pentane	109-66-0		Present		Not Listed
Components	C	CAS-No.	C	CEPA S	chedule I - Toxic Substances
Pentane	1	109-66-0	٩	lot liste	d
Components CAS-No.		CAS-No.			2010 Greenhouse Gases Subject atory Reporting
Pentane	1	109-66-0	Ν	lot liste	d

EU Classification

EU GHS - SV - CLP 1272/2008

Components	CAS-No.	EU GHS - SV - CLP (1272/2008)
Pentane	109-66-0	Flammable liquids - Flam. Liq. 2: H225 Highly flammable liquid and vapour.; Specific target organ toxicity - Single exposure - STOT SE 3: H336 May cause drowsiness or dizziness.; Aspiration hazard - Asp. Tox. 1: H304 May be fatal if swallowed and enters airways.; Hazardous to aquatic environment - chronic hazard - Aquatic Chronic 2: H411 Toxic to aquatic life with long lasting effects.; Supplemental Hazards: EUH066 Repeated exposure may cause skin dryness or cracking.601-006-00-1

EU - CLP (1272/2008)

R-phrase(s)

- R12 Extremely flammable.
- R51 Toxic to aquatic organisms.
- R53 May cause long-term adverse effects in the aquatic environment.
- R65 Harmful: may cause lung damage if swallowed.
- R66 Repeated exposure may cause skin dryness or cracking.
- R67 Vapors may cause drowsiness and diziness.

S -phrase(s)

- S 2 Keep out of the reach of children.
- S 9 Keep container in a well-ventilated place.
- S16 Keep away from sources of ignition No smoking.
- S29 Do not empty into drains.
- S33 Take precautionary measures against static discharges.
- S61 Avoid release to the environment. Refer to special instructions/safety data sheets.
- S62 If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

Components	CAS-No.	Classification	Concentration Limits:	Safety Phrases
Pentane	109-66-0	F+; R12 N; R51-53 Xn; R65 R66 R67	No information	S2 S9 S16 S29 S33 S61 S62

The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger:

Xn - Harmful.

F+ - Extremely flammable.

N - Dangerous for the environment.



16. OTHER INFORMATION

Preparation Date: Revision Date: Prepared by: 01/01/2019 N/A

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Disclaimer:

All chemicals may pose unknown hazards and should be used with caution. This Safety Data Sheet (SDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Dawn Scientific Inc Chemicals & Laboratory Products, assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Dawn Scientific Inc assumes no responsibility for the completeness or accuracy of the information contained herein.

End of Safety Data Sheet