CORCO CHEMICAL CORPORATION

Manufacturers of ACS Reagents and Semiconductor Grade Chemicals

SAFETY DATA SHEET

HEXANE, ACS REAGENT

1. IDENTIFICATION

Product identifier: HEXANE, ACS REAGENT

Product Code Number: 1305

Company Identification:

Corco Chemical Corporation
299 Cedar Lane
Fairless Hills, PA 19030
Phone: 215-295-5006
Fax: 215-295-0781

24 Hour Emergency Telephone Number: CHEMTREC (U.S.): 1-800-424-9300
CHEMTREC (Outside U.S. 1-703-527-3887

Trade Name:	**Hexane, ACS Reagent**
Synonyms:	**n-Hexane; Hexanes, Hexyl hydride**
Chemical Formula:	**CH3(CH2)4CH3**
Product Use:	**Process chemical, Laboratory and scientific research and development**

2. HAZARD(S) IDENTIFICATION

Physical hazards:	**Flammable liquids**	**Category 2**
Health hazards:		
	Acute toxicity, Oral	**Category 4**
	Skin irritation	**Category 2**
	Eye irritation	**Category 2A**
	Reproductive toxicity	**Category 2**

Specific target organ toxicity single exposure	Category 2
Specific target organ toxicity repeated exposure, Inhalation	Category 2
Aspiration hazard	Category 1
Acute aquatic toxicity	Category 2
Chronic aquatic toxicity	Category 2

OSHA hazard(s): Flammable liquid, Target Organ Effect, Irritant, Toxic by ingestion, Teratogen.

Label elements

Signal Words: Danger

Hazard statement: Highly flammable liquid and vapor. Harmful if swallowed. May be fatal if swallowed and enters airways. Causes skin irritation. Causes serious eye irritation. May cause respiratory irritation, and drowsiness or dizziness. Suspected of damaging fertility or the unborn child. May cause damage to organs through prolonged or repeated exposure if inhaled. Toxic to aquatic life with long lasting effects.

Precautionary statement: Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Do not breathe dust/fumes/dust/mist/vapors/spray. Avoid release to the environment. Use personal protective equipment as required. IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do so. Continue rinsing. Do NOT induce vomiting.

Response: In case of fire: Use appropriate media for extinction. Eliminate all ignition sources if safe to do so. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a POISON CENTER or

doctor/physician if you feel unwell. Do NOT induce vomiting. If skin or eye irritation occurs: Get medical advice/attention.

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

Disposal: Dispose of contents/container to an approved incineration plant.

Emergency Overview Breathing vapors may cause drowsiness and dizziness. Cause eye skin, and respiratory tract irritation. Aspiration hazard if swallowed. Can enter lungs and cause damage. Highly flammable liquid and vapor. Static electrical hazard. Target Organs: Central nervous system, eyes, skin, and lungs.

3. Composition/information on ingredients

CAS Number: 110-54-3
EC Number: 203-777-6
Molecular Weight: 86.18 g/mol

Ingredient	CAS Number	EC Number	Percent	Hazardous	Chemical characterization
Hexane	110-54-3	203-777-6	60 -100%	Yes	Substance

4. First-aid measures

Inhalation: If inhaled, remove to fresh air. If breathing is labored or with coughing, give 100% supplemental oxygen. If not breathing, begin artificial respiration. Get medical aid.

Ingestion: Aspiration hazard. Get medical aid. Do not induce vomiting unless directed by medical personnel. Never give anything by mouth to an unconscious person. If not breathing, begin artificial respiration. DO NOT give mouth-to-mouth resuscitation.

Skin Contact: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover irritated skin with an emollient or anti-bacterial cream. Soap and cold water may be used. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact: Check for and remove contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

General information: Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. If you feel unwell, seek medical advice (show the label where possible). Wash contaminated clothing before reuse.

5. Fire-fighting measures

Flammability: Highly flammable liquid and vapor (GHS Category 2)
Auto-ignition Temperature: 225o C (437o F)
Flash Point: -22 o C (-7.6o F)
Flammable Limits: Lower Limit – 1.1 vol %, Upper Limit – 7.5 vol %

Products of Combustion: Will decompose into highly toxic and irritating gases (carbon monoxide and carbon dioxide) under fire conditions.

Specific Fire Hazards: As in any fire, always wear self-contained breathing apparatus in pressure-demand (MSA/NIOSH approved or equivalent), and full protective gear. May accumulate static electric charge and may cause ignition of its own vapors. Use water spray to keep fire exposed containers cool. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas. Hexane floats on water and may travel to a source of ignition and spread fire.

Specific Explosion Hazards: None

Fire Fighting Media: Use dry chemical, carbon dioxide, or appropriate foam. Solid streams of water may be ineffective and spread material. Water will not cool hexane below its flash point.

National Fire Protective Association: Health - 1, Flammability - 3, Reactivity - 0
NOTE: NFPA ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. They are for use by emergency personnel to address the hazards that are presented by short term, acute exposure to this product under fire, spill, or similar emergencies. Ratings involve data and interpretations that may vary from company to company.

6. Accidental release measures

Absorb spilled liquid with sorbent pads, socks, or other inert material such as vermiculite, sand, or earth. Provide ventilation to the affected area and remove all

ignition sources. Avoid run-off into storm sewers and ditches that lead to waterways. Approach the spill from upwind and pick up absorbed material and place it in a suitable container. Use only non-sparking tools and equipment. A vapor suppressing foam may be used. Always use proper personal protective equipment as described in section 8.

Environmental precautions: Contact local authorities in case of spillage to drain/aquatic environment. Avoid discharge into drains, water courses or onto the ground. Avoid release to the environment. Use appropriate containment to avoid environmental contamination. Prevent further leakage or spillage if safe to do so. Do not contaminate water.

7. Handling and storage

Precautions for safe handling: See SDS section 8 for recommendations on the use of personal protective equipment. Use with adequate ventilation and grounding. Wash thoroughly after using. Keep container closed when not in use. Keep away from sources of ignition. No smoking. Take measure to prevent the buildup of electrostatic charge.

Conditions for safe storage, including any incompatibilities: Store in tightly closed, containers in a cool, dry, well ventilated area. Keep away from heat, sparks and flame. Maintain adequate ventilation. Ground all equipment containing this material. Keep away from incompatible materials (see SDS section 10 for incompatibilities). Keep away from oxidizing materials. Protect from moisture.

8. Exposure controls/personal protection

Ventilation System: A system of local and / or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, Industrial Ventilation, A Manual of Recommended Practices, most recent edition, for details.

Skin Protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection: Use chemical safety goggles and / or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Personal Respirators (NIOSH Approved): A respiratory protection program that meets OSHA 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever possible. Always use a NIOSH or

European Standard EN 149 approved respirator when necessary.

Hexane Exposure Limits:

ACGIH – 50 ppm TWA; Skin – potential significant contribution to overall exposure by cutaneous route NIOSH – 50 ppm TWA; 180 mg/m3 TWA; 1100 ppm IDLH OSHA Final PELs – 500 ppm TWA; 1800 mg/m3 TWA.

9. Physical and chemical properties

Physical State and Appearance:	**Clear, colorless liquid.**
Odor:	**gasoline-like odor**
Odor Threshold:	**130 ppm**
Molecular Formula:	**CH3(CH2)4CH3**
Molecular Weight:	**86.18**
Auto-ignition Temperature:	**225o C (437o F)**
Flash Point:	**-22o C (-7.6o F)**
Flammable Limits:	**Lower Limit – 1.1 vol %, Upper Limit – 7.5 vol %**
pH:	**Not available.**
Boiling Point:	**69 o C @ 760 mm Hg**
Freezing/Melting Point:	**-95 o C**
Decomposition Temperature:	**Not available**
Specific Gravity:	**0.659 g/cm3 @ 20o C**
Vapor Density (Air=1):	**2.97**
Vapor Pressure:	**124 mm Hg @ 20o C.**
Viscosity:	**0.31 cP 20o C**
Solubility:	**Insoluble**
Evaporation rate:	**>1**
Conductivity:	**Nonconductive; Conductivity = 3x10-5 pS/m; Dielectric Constant = 1.9; Relaxation Time Constant = ~100 seconds (dissipation)**

10. Stability and reactivity

Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Ignition sources, excess heat, electrical sparks, confined spaces, and vapor accumulation.
Incompatibility With Various Substances: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon, dioxide.
Hazardous Polymerization: Will not occur.

11. Toxicological information

Routes of Entry: Inhalation, skin absorption, skin contact.

Acute Exposure Hazards:

INHALATION HAZARD: Inhalation of vapors irritates the respiratory tract. Overexposure may cause central nervous system depression with lightheadedness, nausea, headache, and blurred vision. Greater exposure may cause muscle weakness, numbness of the extremities, unconsciousness and suffocation. Vapors can displace oxygen, especially in confined spaces.

INGESTION HAZARD: May produce gastrointestinal irritation with abdominal pain, nausea, vomiting, and diarrhea. Aspiration into lungs may cause chemical pneumonitis, which may be fatal. May cause central nervous system depression.

SKIN CONTACT HAZARD: May cause redness, irritation, dryness, cracking, and pain. Defatting or dermatitis may result from prolonged or repeated exposure. Hexane may be absorbed through the skin with possible systemic effects. There are no reports of skin sensitization through occupational exposure. Sensitization was not observed in a maximization test using 25 volunteers.

EYE CONTACT HAZARD: Vapors cause mild irritation. Splashes may cause redness and pain.

Chronic Exposure Hazards: Repeated or prolonged skin contact may defat the skin and produce irritation and dermatitis. Prolonged exposure may cause adverse reproductive effects and visual disturbances. Chronic inhalation may cause peripheral nerve disorders and central nervous system effects. Laboratory tests have resulted in mutagenic effects. May affect the developing fetus. Chronic exposure produces peripheral neuropathy with effects including muscular weakness, paresthesia, numbing of the hands, feet, legs, and arms, unsteadiness, and difficulty walking and standing. Repeated exposure may cause nervous system abnormalities with muscle weakness and damage, motor incoordination, and sensation disturbances. Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the substance.

Animal Toxicity:

Draize test, rabbit, eye: 10 mg Mild;
Inhalation, mouse: LC50 = 150,000 mg/m3/2H;
Inhalation, rat: LC50 = 4800 ppm/4H;
Inhalation, rat: LC50 = 627,000 mg/m3/3M;
Oral, rat: LD50 = 25 g/kg;

Carcinogenicity: Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Occupational polyneuropathy has resulted from hexane exposures as low as 500 ppm, but minimum levels of n-hexane that are neurotoxic in humans haven't been established. Nearly continuous exposure of animals in 250 ppm has caused neurotoxic effects.

Teratogenicity: No evidence of teratogenicity or embryotoxicity in animal studies with hexane. Fetotoxicity has been observed in the presence of maternal toxicity. Reproductive Effects: Severe testicular damage has been observed in rats exposed to hexane at concentrations which have produced other significant toxicity. Although subneurotoxic doses of its principle metabolite, 2,5-hexanedione, can induce progressive testiculartoxicity in rats, there have been no reports of human sterility or other reproductive toxicity associated with n-hexane exposure.

Neurotoxicity: n-Hexane is a mild irritant and central nervous system depressant in acute exposure, but its principle effect are damage to sensory and motor peripheral nerves, particularly in chronic exposure.

Reproductive Effects: Severe testicular damage has been observed in rats exposed to hexane at concentrations which have produced other significant toxicity. Although subneurotoxic doses of its principle metabolite, 2,5-hexanedione, can induce progressive testiculartoxicity in rats, there have been no reports of human sterility or other reproductive toxicity associated with n-hexane exposure.

Mutagenicity: Positive results (chromosomal damage in the bone marrow cells) obtained for rats exposed by inhalation to n-Hexane.

Numerical Measures of Toxicity: Cancer Lists: NTP Carcinogen

Ingredient	Known	Anticipated	IARC Category
Hexane (CAS 110-54-3)	No	No	None

12. Ecological information

Ecotoxicity: Experimental studies involving Hexane show acute aquatic toxicity values of 2.1 mg/L and greater than 1000 mg/L.

Environmental Fate: Persistence: Volatilization from soil surfaces is expected to be an important fate process. Hexane will be degraded in the atmosphere by reaction with hydroxyl radicals; the half-life of this reaction in air is estimated to be three days. Screening studies suggest that Hexane will undergo biodegradation in soil and water surfaces, but volatilization in expected be the predominant fate process in the environment. Hydrolysis is not expected to be an important environmental

fate process. Bioaccumulation: An estimated bioconcentration factor (BCF) of 2300 and log Kow of 3.9 for Hexane suggest the potential for bioconcentration in aquatic organisms is high. Metabolites may partially bioaccumulate in the lipid bilayer of fish tissues. Mobility: Hexane is highly volatile and will partition rapidly in the air. When released into water, Hexane will be lost by volatilization and biodegradation. Hexane is expected to have high mobility in soils/sediments based on a Koc of 150. Volatilization from moist soil surfaces is expected to be an important fate process based on a Henry's law constant of 1.83 atm-m3 /mole. Hexane may volatilize from dry surfaces based on its vapor pressure.

Mobility in Soil: When released into the soil, this material is not expected to leach into groundwater. When released into the soil, this material is expected to quickly evaporate.

13. Disposal considerations

Material that cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Processing, use or contamination of this product may change the waste management options. Waste generators must decide if discarded material is a hazardous waste. State and local disposal regulations may differ from federal disposal definitions found in 40 CFR 261.3. Dispose of container and unused contents in accordance with federal, state and local requirements.

Contaminated packaging: Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transportation Information

UN Number: UN1208
UN Proper Shipping Name: HEXANES
Packing Group: II

DOT / IMDG / IATA

Land Transport ADR/RID and GGVS/GGVE (Cross Border / Domestic)
Transport Hazard Class(es): 3
Maritime Transport IMDG/GGVSea
Transport Hazard Class(es): 3
Marine Pollutant: No
Air Transport ICAO-TI and IATA-DGR
Transport Hazard Class(es): 3
Transport in Bulk According to Annex II of MARPOL 73/78 and the IBC Code.

Special Precautions for User: No additional information.

15. Regulatory information

US Federal Regulations:

TSCA: CAS# 110-54-3 is listed on the TSCA Inventory.
Health and Safety Reporting List: CAS# 110-54-3 is not listed.
Chemical Test Rules: CAS# 110-54-3 is not listed.
Section 12b: CAS# 110-54-3 is not listed.
TSCA Significant New Use Rule: Does not have an SNUR under TSCA.

CERCLA Hazardous Substances: CAS# 110-54-3 – 5000 lb final RQ; 2270 kg final RQ
SARA Section 302: Does not have a TPQ
SARA Codes: CAS# 110-54-3 – immediate, delayed, fire
Section 313: n-Hexane (CAS# 110-54-3) is subject to SARA Title III Section 313 and 40 CFR 373 reporting requirements.
Clean Air Act: CAS# 110-54-3 is listed as a hazardous air pollutant (HAP). It is not a Class 1 Ozone Depleter. It is not a Class 2 Ozone Depleter.
Clean Water Act: CAS# 110-54-3 is not listed as a Hazardous Substance. It is not a Priority Pollutant. It is not a Toxic Pollutant.
OSHA: Not considered highly hazardous by OSHA.

US state regulations:

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.
US. Massachusetts RTK - Substance List
HEXANE (CAS 110-54-3)
US. New Jersey Worker and Community Right-to-Know Act
HEXANE 9CAS 110-54-3)
US. Pennsylvania RTK - Hazardous Substances
HEXANE (CAS 110-54-3)
US. Minnesota RTK
HEXANE (CAS 110-54-3)

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance
Not listed

Canada:

DSL/NDSL: CAS# 110-54-3 is listed on Canada's DSL list.
WHMIS: This product has a WHMIS classification of B2, D2B. This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and this MSDS contains all the information required by those regulations. Ingredient Disclosure List: CAS# 110-54-3 is listed on Canada's Ingredient Disclosure List.
DSCL (EEC):

Hazard Symbols: Xn; F; N
Risk Phrases: R11 – Highly Flammable; R38 – Irritating to skin; R48/20 – Harmful, danger of serious damage to health by prolonged exposure through inhalation; R62 – Possible risk of impaired fertility; R51/53 – Toxic to aquatic organisms, may cause long term adverse effects in the aquatic environment; R65 – Harmful, may cause lung damage if swallowed; R67 – Vapors may cause drowsiness and dizziness.
Safety Phrases: S16 – Keep away from sources of ignition-no smoking; S29 – Do not empty into drains; S33 – Take precautionary measures against static discharge; S36/37: Wear suitable protective clothing and gloves; S9 – Keep container in well ventilated place; 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.
WGK (Water Danger/protection): CAS# 110-54-3: 1.

16. Other information

Disclaimer - The information in the sheet was written based on the best knowledge and experience currently available. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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