

An ISO 9001:2000
Certified Company



THE POWER OF THREE³

PHARMCO-AAPER

AND COMMERCIAL ALCOHOLS

Product Information (203) 740-3471 / Emergency Assistance CHEMTREC 1-800-424-9300

MATERIAL SAFETY DATA SHEETS

Manufacturer: PHARMCO-AAPER
58 Vale Road
Brookfield, Connecticut 06804, USA
Phone (203) 740-3471
Fax (203) 740-3481

1101 Isaac Shelby Drive
Shelbyville, KY 40065
Phone (502) 633-0650
Fax (502) 633-0685

Cyclohexanone

1. CHEMICAL PRODUCT IDENTIFICATION

Product Name: Cyclohexanone
Synonyms: Adronal; Cyclohexyl alcohol; Hexalin; Hexahydrophenol; Hydroxycyclohexane, Cyclohexyl ketone,
Nicotinic acid adenine dinucleotide
Molecular Formula: $C_6H_{10}(=O)$
Molecular Weight: 98.15

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient(s)	CAS Number	% (by weight)
Cyclohexanone	108-94-1	100.0

3. HAZARDS IDENTIFICATION

WARNING! FLAMMABLE LIQUID. CAUSES RESPIRATORY TRACT IRRITATION. CAUSES SKIN IRRITATION. HARMFUL IF ABSORBED THROUGH THE SKIN. MAY CAUSE DIGESTIVE TRACT IRRITATION. MAY BE HARMFUL IF SWALLOWED. MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION. MAY CAUSE SEVERE EYE IRRITATION AND POSSIBLE INJURY.

NFPA Hazard Ratings: Health - 1, Flammability - 2, Reactivity - 0

NOTE: NFPA ratings involve data and interpretations that may vary from company to company. They are intended

only for rapid, general identification of the magnitude of the specific hazard. To deal adequately with the safe handling of this material, all the information contained in this MSDS must be considered.

Potential Health Effects

Eye: May result in corneal injury. Vapors may cause eye irritation. Contact produces irritation, tearing, and burning pain.

Skin: Causes skin irritation. Harmful if absorbed through the skin.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause liver and kidney damage. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. May be harmful if swallowed.

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by headache, dizziness, unconsciousness and coma. May cause liver and kidney damage. May cause narcotic effects. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema.

Chronic: Prolonged or repeated skin contact may cause defatting and dermatitis. Prolonged exposure may cause non-specific nervous system effects.

Target Organs: Kidneys, central nervous system, liver.

4. FIRST AID MEASURES

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower lids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Cyclohexanone in urine can be useful in diagnosis.

5. FIRE FIGHTING MEASURES

Autoignition Temperature: 520 deg C (968.00 deg F)

Flash Point: 46 deg C (114.80 deg F)

Explosion Limits, Lower: 1.10 vol % Upper: 8.10 vol %

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire. Flammable Liquid. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

Extinguishing Media: Use water spray to cool fire-exposed containers. Water may be ineffective. For large fires, use water spray, fog or alcohol-resistant foam. Do NOT use straight streams of water. For small fires, use carbon dioxide, dry chemical, dry sand, or alcohol-resistant foam. Cool containers with flooding quantities of water until well after fire is out.

6. ACCIDENTAL RELEASE MEASURES

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material, (e.g., dry sand or earth), then place into a chemical waste container. Remove all sources of ignition.

7. HANDLING AND STORAGE

Handling: Wash thoroughly after handling. Use with adequate ventilation. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid contact with heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

ACGIH: 25 ppm; 100 mg/m³; skin - potential for cutaneous absorption

NIOSH: 25 ppm TWA; 100 mg/m³ TWA; 700 ppm IDLH

OSHA - Final PELs: 50 ppm TWA; 200 mg/m³ TWA

OSHA Vacated PELs: 25 ppm TWA; 100 mg/m³ TWA

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid

Appearance: Not available.
Odor: Acetone or peppermint odor
pH: Not available.
Vapor Pressure: 4.5 mbar @ 20 deg C
Vapor Density: Not available.
Evaporation Rate:
Viscosity: Not available.
Boiling Point: 155760.00 deg C
Freezing/Melting Point: -47 deg C
Decomposition Temperature: Not available.
Solubility: soluble in all common organic solvents
Specific Gravity/Density: 0.9470g/cm3

10. STABILITY AND REACTIVITY

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, ignition sources, excess heat.

Incompatibilities with Other Materials: Incompatible with chlorine. Reacts violently with oxidizing agents such as nitric acid and hydrogen peroxide, even at room temperature, to form an explosive material. Contact with chromium trioxide (chromic acid) causes immediate ignition.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, toxic gases.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

RTECS#:

CAS# 108-94-1: GW1050000

LD50/LC50:

CAS# 108-94-1:

Inhalation, rat: LC50 = 8000 ppm/4H;

Oral, mouse: LD50 = 1400 mg/kg;

Oral, rat: LD50 = 1535 mg/kg;

Skin, rabbit: LD50 = 948 mg/kg;

Carcinogenicity:

CAS# 108-94-1:

ACGIH: A4 - Not Classifiable as a Human Carcinogen

IARC: Group 3 carcinogen

Epidemiology: Results indicate the evidence for carcinogenic activity is marginal and the effect if any is weak. (Lijinsky, W et al. J.Natl.Cancer Inst.1986, 77, 941-949)

Teratogenicity: No data available.

Reproductive Effects: No data available.

Neurotoxicity: No data available.

Mutagenicity: No data available.

Other Studies: Irritation to human eyes has been observed after 3-5 min exposure to 50-75 ppm.

12. ECOLOGICAL INFORMATION

Ecotoxicity: Not available.
Environmental Fate: Not available.
Physical/Chemical: Not available.
Other: Not available.

13. DISPOSAL CONSIDERATION

Dispose of in a manner consistent with federal, state, and local regulations.
RCRA D-Series Maximum Concentration of Contaminants: None listed.
RCRA D-Series Chronic Toxicity Reference Levels: None listed.
RCRA F-Series: None listed.
RCRA P-Series: None listed.
RCRA U-Series: CAS# 108-94-1: waste number U057 (Ignitable waste).

14. TRANSPORT INFORMATION

Domestic (Land, D.O.T.)
Proper Shipping Name: Cyclohexanone
Hazard Class: 3
UN/NA: UN1915
Packing Group: III

International (Water, I.M.O.)
Proper Shipping Name: Cyclohexanone
Hazard Class: 3.3
UN/NA: UN1915
Packing Group: III

International (Air, I.C.A.O.)
Proper Shipping Name: Cyclohexanone
Hazard Class: 3
UN/NA: UN1915
Packing Group: III

15. REGULATORY INFORMATION

US FEDERAL

TSCA: CAS# 108-94-1 is listed on the TSCA inventory.
Health & Safety Reporting List: CAS# 108-94-1: Effective Date: October 4, 1982; Sunset Date: October 4, 1992
Chemical Test Rules: None of the chemicals in this product are under a Chemical Test Rule.
Section 12b: None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule: None of the chemicals in this material have a SNUR under TSCA.
SARA
Section 302 (RQ): CAS# 108-94-1: final RQ = 5000 pounds (2270 kg)
Section 302 (TPQ): None of the chemicals in this product have a TPQ.
SARA Codes: CAS # 108-94-1: acute, flammable, reactive.
Section 313: No chemicals are reportable under Section 313.

Clean Air Act: This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.
Clean Water Act: None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of

the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center of release of quantities of Hazardous Substances equal or greater than the reportable quantities (RQs) in 40 CFR 302.4. Components present in this product at a level which could require reporting under the statute are:

Chemical Name	CAS Number	RQ
Cyclohexanone	108-94-1	5,000lb

OSHA: None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 108-94-1 can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: XN

Risk Phrases: R 10 Flammable. R 20 Harmful by inhalation.

Safety Phrases: S 25 Avoid contact with eyes.

WGK (Water Danger/Protection)

CAS# 108-94-1: 1

Canada

CAS# 108-94-1 is listed on Canada's DSL/NDSL List.

This product does not have a WHMIS classification.

CAS# 108-94-1 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 108-94-1: OEL-AUSTRALIA:TWA 25 ppm (100 mg/m³) OEL-AUSTRIA:TWA 50 ppm (200 mg/m³) OEL-BELGIUM:TWA 25 ppm (100 mg/m³) OEL-CZECHOSLOVAKIA:TWA 200 mg/m³;STEL 400 mg/m³ OEL-DENMARK:TWA 25 ppm (100 mg/m³) OEL-FINLAND:TWA 50 ppm (200 mg/m³);STEL 75 ppm (250 mg/m³) OEL-FRANCE:TWA 25 ppm (100 mg/m³) OEL-GERMANY:TWA 50 ppm (200 mg/m³) OEL-HUNGARY:TWA 100 mg/m³;STEL 200 mg/m³;Skin OEL-JAPAN:TWA 25 ppm (100 mg/m³) OEL-THE NETHERLANDS:TWA 50 ppm (200 mg/m³) OEL-THE PHILIPPINES:TWA 50 ppm (200 mg/m³) OEL-POLAND:TWA 2 mg/m³ OEL-RUSSIA:TWA 25 ppm;STEL 10 mg/m³ OEL-SWEDEN:TWA 25 ppm (100 mg/m³);STEL 50 ppm (20 mg/m³); Skin OEL-SWITZERLAND:TWA 25 ppm (100 mg/m³);STEL 50 pp (200 mg/m³) OEL-TURKEY:TWA 50 ppm (200 mg/m³) OEL-UNITED KINGDOM:TWA 25 ppm (100 mg/m³);STEL 10 ppm OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

16. OTHER INFORMATION

The information contained herein is based on current knowledge and experience; no responsibility is accepted that the information is sufficient or correct in all cases. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment.