

MATERIAL SAFETY DATA SHEET



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N,N-DIMETHYLFORMAMIDE

MSDS No. M0081

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Isopropyl Alcohol

Product Catalog Number(s): DB0454, DB0455, DH3851, DH3852, DR0456, DR2536, DS1451

Synonyms: DMF; Dimethylformamide; Formyldimethylamine; Formamide, N,N-Dimethyl-

Chemical Formula: HCON(CH₃)₂

Recommended Use: This product is recommended for laboratory and manufacturing use only. It is not recommended for drug, food or household use.

2. COMPOSITION AND INFORMATION ON INGREDIENTS

<u>Ingredient</u>	<u>CAS No</u>	<u>Percent</u>	<u>Hazardous</u>
N,N-Dimethylformamide	68-12-2	98-100%	Yes

3. HAZARDS IDENTIFICATION

WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. MAY CAUSE HARM TO THE UNBORN CHILD. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. MAY CAUSE LIVER DAMAGE. FLAMMABLE LIQUID AND VAPOR. TARGET ORGANS: LIVER RESPIRATORY SYSTEM, EYES, SKIN.



Acute Exposure Hazards:

Inhalation Hazard: Causes respiratory tract irritation.

Ingestion Hazard: Causes gastrointestinal irritation with nausea, vomiting, and diarrhea. May cause liver damage.

Skin Contact Hazard: Causes skin irritation.

Eye Contact Hazard: Causes eye irritation.

Chronic Exposure Hazards: Repeated or prolonged exposure may cause dermatitis and defatting of skin. Chronic exposure may cause liver damage. May cause fetal effects based on animal studies.

4. FIRST-AID MEASURES

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do not use mouth-to-mouth resuscitation. If breathing has stopped, apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Ingestion: Call a poison control center. Do not induce vomiting unless directed by medical personnel. If vomiting occurs naturally, have victim lean forward. Never give anything by mouth to an unconscious person. Get medical aid.

Skin Contact: Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention.

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.

Notes to Physician: Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES

Flammability: Flammable liquid and vapor (GHS Category 3)

Auto-ignition Temperature: 445° C (833° F)

Flash Point: 57° C (134° F)

Flammable Limits: Lower Limit – 2.2 vol %, Upper Limit – 15.2 vol %

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

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. Vapors may form explosive mixtures with air. 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.

Specific Explosion Hazards: No information available..

Fire Fighting Media: Water may be ineffective. Do not use straight streams of water. For small fires, use dry chemical, carbon dioxide, water spray, or alcohol-resistant foam. For larger fires, use water spray, fog, or alcohol-resistant foam.

National Fire Protective Association: 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.

6. ACCIDENTAL RELEASE MEASURES

Use water spray to reduce vapors. Water spray may reduce vapors but still not prevent ignition in closed spaces. Absorb spilled liquid with sorbent pads, socks, or other inert material such as vermiculite, sand, or earth. Use spark-proof tools. Provide ventilation to the affected area and remove all ignition sources. Approach the spill from upwind and pick up absorbed material and place it in a suitable container. Always use proper personal protective equipment as described in section 8.

7. HANDLING AND STORAGE

Precautions: Always use proper personal protective equipment as described in section 8. Wash thoroughly after handling. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Remove contaminated clothing and wash before reuse. Empty containers contain product residue (liquid and vapor) and can be dangerous. Keep container tightly closed and away from heat, spark, and flame. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks, or open flames. Use with adequate ventilation. Avoid breathing vapor or mist.

Storage: Keep in a flammables area away from direct sunlight and all sources of ignition and oxidizing materials. Keep 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 explosion-proof ventilation equipment. Facilities storing or using the material should be equipped with eyewash station and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Personal Protection: Wear chemical splash goggles. Use butyl rubber gloves and protective clothing to prevent skin exposure. 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.

Exposure Limits:

ACGIH – 100 ppm TWA; Skin – potential significant contribution to overall exposure by the cutaneous route.

NIOSH – 10 ppm TWA; 30 mg/m³ TWA; 500 ppm IDLH

OSHA Final PELs – 10 ppm TWA; 30 mg/m³ TWA

OSHA Vacated PELs: 10 ppm TWA; 30 mg/m³ TWA

Eye Protection: Wear protective chemical goggles or other appropriate eye protection.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State and Appearance: Clear, colorless liquid.

Odor: Faint amine odor

Odor Threshold: 100 ppm

Taste: Not available

Molecular Formula: HCON(CH₃)₂

Molecular Weight: 73.09

pH: 6-8 @ 20% aqueous solution

Boiling Point: 153° C @ 760 mm Hg

Freezing/Melting Point: -61° C

Decomposition Temperature: Not available

Specific Gravity: 0.94 g/cm³

Vapor Density (Air=1): 2.5

Vapor Pressure: 4.9 mbar @ 20° C.

Evaporation Rate (Butyl acetate = 1): 0.17

Viscosity: 0.8 mPas 20° C

Solubility: Soluble

10. STABILITY AND REACTIVITY

Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Ignition sources, excess heat.

Incompatibility With Various Substances: Strong oxidizing agents, ammonia, anhydrides, iron, phenols, isocyanates, acids (mineral non-oxidizing e.g. hydrochloric acid, hydrofluoric acid, muriatic acid, phosphoric acid), acid (mineral oxidizing e.g. chromic acid, hypochlorous acid, nitric acid, sulfuric acid), metals (alkali and alkaline e.g. cesium, potassium, sodium), metals and metal compounds (toxic e.g. beryllium, lead acetate, nickel carbonyl, tetraethyl lead), reducing agents (strong e.g. aluminum carbide, chlorosilane, hydrogen phosphide, lithium hydride), carbon tetrachloride, chlorinated hydrocarbons, organic materials..

Hazardous Decomposition Products: Irritating and toxic fumes and gases, oxides of nitrogen, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Routes of Entry: Inhalation, skin absorption, skin contact

Animal Toxicity (RTECS):

Inhalation, mouse: LC50 = 9400 mg/m³/2H;

Inhalation, rat: LC50 = 3421 ppm/1H;

Inhalation, rat: LC50 = 3421 ppm/3H;

Inhalation, rat: LC50 = 948 ppm/3H;

Oral, mouse: LD50 = 2900 mg/kg;

Oral, rabbit: LD50 = 5 g/kg;

Oral, rat: LD50 = 2800 mg/kg;

Skin, rabbit: LD50 = 4720 mg/kg;

Skin, rat: LD50 = 3 g/kg;

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

Epidemiology: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies: No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity: No information available.

Environmental Fate: No information available.

Physical: No information available.

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. This material is not a "P" listed waste under 40 CFR 261.33. It is not a "U" listed waste.

14. TRANSPORT INFORMATION

US DOT

Proper Shipping Name: N,N-Dimethylformamide

Hazard Class: 3

UN Number: UN2265

Packing Group: III

Canada TDG

Proper Shipping Name: N,N-Dimethylformamide

Hazard Class: 3

UN Number: UN2265

Packing Group: III

Additional Information: No information available.

International (Water, I.M.O.)

Proper Shipping Name: N,N-Dimethylformamide

Hazard Class: 3

UN Number: UN2265

Packing Group: III

International (Air, I.C.A.O.)

Proper Shipping Name: N,N-Dimethylformamide

Hazard Class: 3

UN Number: UN2265

Packing Group: III

15. REGULATORY INFORMATION

US Federal Regulations:

TSCA: CAS# 68-12-2 is listed on the TSCA Inventory.

Health and Safety Reporting List: Effective 4/13/89, Sunset 12/19/95.

Chemical Test Rules: Not listed.

Section 12b: Not listed.

TSCA Significant New Use Rule: Does not have an SNUR under TSCA.

CERCLA Hazardous Substances: CAS# 68-12-2: 100 lb final RQ, 45.4 kg final RQ

SARA Section 302: Does not have a TPQ

SARA Codes: CAS# 68-12-2 – immediate, fire

Section 313: 100 % N,N-Dimethylformamide (68-12-2) is subject to SARA Title III Section 313 and 40 CFR 373 reporting requirements.

Clean Air Act: CAS# 68-12-2 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# 68-12-2 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:

CAS# 68-12-2 is on the following state right-to-know lists: California, New Jersey, Pennsylvania, Minnesota, and Massachusetts

California Prop 65: California No Significant Risk Level: Not listed

Canada:

DSL/NDSL: CAS# 68-12-2 is listed on Canada's DSL list.

WHMIS: This product has a WHMIS classification of B3, D2A, 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# 68-12-2 is listed on Canada's Ingredient Disclosure List.

DSC (EEC):

Hazard Symbols: Xi, F, T

Risk Phrases: R20/21 – Harmful by inhalation and contact with the skin; R36 – Irritating to eyes; R61 – May cause harm to the unborn child.

Safety Phrases: S45 – In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible); S53 – Avoid exposure – obtain special instruction before use.

WGK (Water Danger/protection): CAS# 68-12-2: 1

16. OTHER INFORMATION

Originally Prepared: 1/1/2006

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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.

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