SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product: FORMAzol
Cat. No: FO 121

Molecular Research Center, Inc.
5645 Montgomery Rd.
Cincinnati, Ohio 45212
USA 1-888-841-0900
Fax: 513-841-0080

Product Name: FORMAzol
Application: RNA solubilization solvent
Chemical Formula: stabilized formamide
Molecular Weight: 45.05
Synonyms: Carbamaldehyde, Methanamide

CHEMTREC EMERGENCY NUMBER: Only in the event of an emergency involving a spill, leak, fire exposure or accident. USA: 1-800-424-9300; International: +1-703-527-3887.

2. HAZARD IDENTIFICATION

GHS Classification in accordance with OSHA 29CFR 1910 HCS

Carcinogenicity (Category 2)
Reproductive toxicity (Category 1B)
Specific target organ toxicity (Category 2)

GHS Label elements

Pictogram:

Signal word **Danger**

Health Hazard

Hazard Class	Hazard category	Code	Health Hazard Statements
Carcinogenicity	Category 2	H351	Suspected of causing cancer
Reproductive toxicity	Category 1B	H360	May damage fertility or unborn child
Specific target organ toxicity -repeated exposure-Oral	Category 2	H373	May cause damage to organs (blood) through prolonged or repeated exposure when swallowed.

Precautionary statements

Code	Prevention precautionary statements
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P233	Keep container tightly closed.
P260	Do not inhale dust/fume/gas/mist/vapors or spray.
P264	Wash…thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P281	Use personal protective equipment as required.
P308 + P313	If exposed or concerned: Get medical advice / attention.
P405	Store locked up.
P501	Dispose of contents/container to an approved waste disposal plant.

EFFECTS OF OVEREXPOSURE: May cause respiratory and digestive tract irritation. May cause eye and skin irritation. The chemical may also cause reproductive and fetal effects. **Target organs:** Central nervous system, liver, eyes, reproductive system, skin, mucous membranes.

ROUTES OF ENTRY:	Inhalation	Yes
	Skin	Yes
	Ingestion	Yes

ACUTE EFFECTS

EYE EXPOSURE: May cause eye irritation, redness and pain. Eye contact may result in serious damage to eyes.

SKIN EXPOSURE: May cause skin irritation and mucus membrane irritation. Symptoms include redness, itching and pain. Harmful if exposed through skin. Studies have shown that formamide can be absorbed through the skin in quantities sufficient to produce systemic toxicity.

INGESTION: May cause irritation of the digestive tract. The chemical may affect the central nervous system, cause headache, dizziness, nausea, vomiting, abdominal pain, and unconsciousness. Exposure may affect reproductive system.

INHALATION: May cause respiratory tract irritation. Symptoms may include coughing and shortness of breath. Inhalation of high concentrations of vapor may cause central nervous system effects including headache, dizziness, unconsciousness and coma depending on the duration of exposure.

CHRONIC EFFECTS

Prolonged and repeated exposure may cause birth defects including congenital malformation in the fetus. Chronic exposure may cause liver damage. There is a danger of cumulative effects.

HMIS Classification (scale 0-4)

Health Hazard 2
Flammability 1
Physical hazards 0
PPE = D*
Use chemical fume hood for adequate ventilation.

NFPA Rating (scale 0-4)

Health Hazard 2
Fire 1
Reactivity 0

3. COMPOSITION/Information on Ingredients

Component	Classification	Concentration
Formamide	CAS-No 75-12-7 EC-No. 200-842-0 Index-No. 616-052-00-8 Registration No. 01-2119496064-35-XXXX	> 95%

Formamide is included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No. 1907/2006 (REACH)

4. FIRST AID

GENERAL ADVICE: Move out of dangerous area. Consult a physician. Show safety data sheet to the doctor in attendance.

EYE CONTACT: Remove any contact lenses. Immediately flush eyes with copious amounts of water for 15 minutes while lifting upper and lower lids. Consult a physician.

SKIN CONTACT: Remove contaminated clothing and thoroughly wash and clean items before reuse. Flush skin with soap and water for 15 minutes. Get medical treatment if irritation develops and persists.

INHALATION: Remove to fresh air. Get medical aid immediately. If not breathing, give artificial respiration. If breathing is difficult, provide oxygen. Consult a physician.

INGESTION: If victim is conscious, wash mouth out with water. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Loosen tight clothing such as collar, tie, belt, etc. Consult a physician.

5. FIRE FIGHTING MEASURES

The chemical emits toxic fumes under fire conditions such as carbon monoxide and ammonia. Wear self-contained breathing apparatus and MSHA/NIOSH approved protective gear.

Flash point:	Open cup 154 C (309 F. Moderate fire hazard when heated.
Explosion limits:	Explosive mixtures may be formed when heated above the flash point.
Auto-Ignition Temp:	499 C (930 F)

EXTINGUISHING MEDIA: Small fires can be extinguished with a water spray, water foam, carbon dioxide or a dry chemical extinguisher. Do not use water jet. Wear self-contained breathing apparatus or approved respirator. Fires involving formamide will likely produce very toxic gases that should not be inhaled.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PROTECTIVE EQUIPMENT: Use gloves, boots, safety glasses, other impervious clothing to avoid skin contact.

SPILLS OR LEAKS: Ventilate area of leak or spill. Wear self-contained breathing apparatus and MSHA/NIOSH approved protective gear. Absorb spill with earth, sand, vermiculite or other non-combustible material and place in sealed containers. Wash spill site after material pickup is complete. Do not use combustible materials such as sawdust and do not flush into sewer.

7. HANDLING AND STORAGE

Use with adequate ventilation and wash hands thoroughly after handling. Store the reagent in a cool (2-8 C), dry and well-ventilated area. Refrigeration may be appropriate for long-term storage or sporadic use. Keep container tightly closed to avoid exposure. Do not store in direct sunlight. Empty containers pose a fire risk. Allow residue to evaporate in a fume hood before disposal of container.

.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Handle in accordance with good industrial hygiene and safety practice.

PERSONAL PROTECTIVE EQUIPMENT: Wear appropriate eye protection, gloves and lab coat for routine operations. Do not eat or drink in area where reagent is used. Avoid contact with skin and eyes. Do not breathe vapor. Laboratory should be equipped with an eye wash station and appropriate exhaust ventilation. Keep away from oxidizing agents, acids and alkali.

FORMAMIDE EXPOSURE LIMITS:
ACGIH: 10 ppm TWA; Skin-potential significant contribution to overall exposure by the cutaneous route.
NIOSH: 10 ppm TWA; 15 mg/m^3 TWA.
OSHA Air Contaminants: 20 ppm TWA, 30 mg/m^3; STEL 30 ppm, 45 mg/m^3

9. PHYSICAL AND CHEMICAL PROPERTIES

Description:	Clear, colorless-yellow liquid
Odor:	Ammonia odor
Chemical formula:	CH3NO
Molecular weight:	45.04g/mol
Melting point:	2.55 C (36.6 F)
Boiling point:	210 C (410 F)
Density:	1.134 g/cm3 (water =1) at 25 C
Ignition Temp	500 C (932 F)
Vapor pressure:	.06 mm Hg @ 25 C
Solubility:	Infinitely soluble with water Sol. in ethanol, acetone
pH value:	4-5 (20% in water, 20 C)
Lower explosion Limit	2.7 %
Upper Explosion Limit	19 %

10. STABILITY AND REACTIVITY

STABILITY: Stable at room temperature and pressure. Avoid ignition sources, excess heat. Avoid light, moisture and temperatures above 180 C. Keep container tightly closed to avoid uptake of water from air.

INCOMPATIBILITIES: Aluminum, acids, bases, strong oxidizing agents, calcium nitrate, iodine, pyridine and sulfur trioxide. Copper, brass, lead and rubber are attacked by formamide.

HAZARDOUS DECOMPOSITION PRODUCTS: Nitrogen oxides, carbon monoxide and carbon dioxide. At the boiling point, ammonia, carbon dioxide and hydrogen cyanide are liberated. Thermal decomposition > 90 C.

CONDITIONS TO AVOID: Heat, flames and ignition sources.

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: Rat: Oral acute LD50 = 5,570mg/kg; Inhalation >3900 ppm / 6h. **Mouse:** Oral LD50 = 3150 mg/kg. Draize eye test, rabbit: 100 mg Severe. **Skin rabbit**: LD 50 =17 gm / kg. Investigated as a tumorigenic, mutagenic and reproductive effector.

TERATOGENICITY: Embryo or fetus: Death, skin-rat = 1200 mg / kg; stunted fetus growth. Oral-rat TDLO = 2 g / kg; Specific Developmental Abnormalities: craniofacial and musculoskeletal, oral-rat TDLO = 7980 mg/kg.

MUTAGENICITY: RTECS # LQ0525000 for mutation data.

12. ECOLOGICAL INFORMATION

ECOTOXICITY: When released into the soil, formamide may be biodegradable but it is expected to leach into the ground water. The chemical has an estimated bioconcentration factor (BCF) of less than 100. When released into the air, this material is expected to readily degrade by reaction with photochemically produced hydroxyl radicals with a half-life of less than 1 day. Minnow LC50 =500 mg / L / 48 h.

Toxicity to fish	static test LC50-Leuciscus idus (Golden orfe) – 6.569 mg/l - 96 h
Toxicity to daphnia	static test LC50-Daphnia magna (Water flea) - 500 mg/l - 48 h
Toxicity to algae	static test LC50-Desmodesmus subspicatus (green algae) - >500 mg/l - 72 h
Toxicity to bacteria	Respiration inhibition EC50 – Sludge Treatment- > 100mg/l – 30 min (OECD Test Guideline 301A)

13. DISPOSAL CONSIDERATIONS

Observe all federal, state and local regulations. Offer surplus and non-recyclable solutions to a licensed disposal company. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Mix with combustible solvent and burn in a chemical incinerator with an after burner and scrubber.

14. TRANSPORTATION INFORMATION

DOT: Not a DOT controlled material (United States).
IMO: Not regulated as hazardous material.
IATA: Not regulated as hazardous material.
RID/ADR: Not regulated as hazardous material.

15. REGULATORY INFORMATION

REACH No.: 01-2119496064-35-XXXX

FEDERAL AND STATE REGULATIONS:
CAS # 75-12-7 can be found on the following state right to know lists: California, Illinois, Rode Island, Pennsylvania, Minnesota, Massachusetts and New Jersey.

OSHA:	Hazardous by definition of Hazard Standard (29 CFR 1910.1200). Target organ effect, irritant, teratogen, reproductive hazard and mutagen.
TSCA:	CAS#75-12-7 TSCA 8(b) inventory: Formamide TSCA 8(a) PAIR: Formamide TSCA 8(d) H and S data reporting: Formamide
WHMIS(Canada):	CLASS D-2A: Material causing other toxic effects (very toxic)
SARA CODES:	CAS#75-12-7 immediate, delayed. SARA311/312 Hazards: Acute and chronic health hazard.
EINECS NO:	200 842 0
RISK PHRASES:	36/37/38/47
SAFETY PHRASES:	23/26/36/53

16. OTHER INFORMATION

Reviewed by	BW, MJ
Creation date	6/30/99
Revision date	10/16/2023 SP

Reason for Revision: Update to Globally Harmonized System of Chemical Classification.

This information is believed to be accurate and represents the information currently available to us. However, we make no warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.