

## Material Safety Data Sheet

**1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING**

Product name	DAF-2 DA
Product code	SK1002-01
Company name	Goryo Chemical, Inc.
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**2. HAZARDS IDENTIFICATION**

(Dimethyl Sulfoxide)

GHS classification

Classification of the substance or mixture

Serious eye damage/eye irritation

Category 2B – (H320)

Hazardous/Non-hazardous Components

Nocuous

By heating at the boiling point, Dimethyl Sulfoxide is decomposed slightly and forms formaldehyde. Formaldehyde causes eye irritation and mucosal irritation. Additionally, it forms offensive substance such as methyl sulfide and methyl mercaptan by pyrolysis. Methyl sulfide and methyl mercaptan liberates hazardous sulfur dioxide gas by inflammation.

Effect on environment

No data available

Physically and chemical hazards

Flammable Liquid

(DAF-2 DA)

Hazardous/Non-hazardous Components

Nocuous

No data available

Effect on environment

No data available

Physically and chemical hazards

No data available

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Single or mixture

Mixture

Main Ingredients

See the table below

Chemical Name	CAS No.	Chemical Formula	Content per Vial
Dimethyl Sulfoxide (DMSO)	67-68-5	C <sub>2</sub> H <sub>6</sub> OS	450μL
DAF-2 DA	—	—	1mg

**4. FIRST AID MEASURES**

Skin contact

- Wash off immediately with plenty of water. If symptoms persist, call a physician.
- If skin stimulates or rash appears, call a physician.

Eye contact

- Rinse thoroughly with plenty of water, also under the eyelids. If symptoms persist, consult a physician.
- Take off your contact lens when wash with water.

Inhalation

- Move to fresh air. If symptoms persist, consult a physician.
- If feeling bad, call a physician.

Ingestion

- Rinse mouth and throat.
- Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.

Notes to physician

- Treat symptomatically.

Protection of first-aiders

- A rescuer should wear personal protective equipment, such as rubber gloves and airtight goggles.

**5. FIRE-FIGHTING MEASURES**

Suitable extinguishing media

Water spray, Alcohol resistance, Powder, Carbon dioxide

Specifically dangerous hazards

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

Extinguishing method

Fire-extinguishing work is done from the windward and the suitable fire-extinguishing method according to the surrounding situation is used. Uninvolved persons should evacuate to a safe place. In case of fire in the surroundings: Remove movable containers if safe to do so.

**6. ACCIDENTAL RELEASE MEASURES**

Personal precautions

- Use personal protective equipment. Keep people away from and upwind of spill/leak.
- Remove ignition source around product.

Environmental precautions

- Prevent product from entering drains.

Methods and materials for containment and cleaning up

- Do not touch spilled material without suitable protection. After material is completely picked up, wash the spill site with soap and water and ventilate the area. Put all wastes in a plastic bag for disposal and seal it tightly. Remove, clean, or dispose of contaminated clothing.

**7. HANDLING AND STORAGE**

Handling

Technical measures

- Handling is performed in a well-ventilated place.
- Avoid contact with skin, eyes and clothing.
- Wear suitable protective equipment.
- Wash hands and face thoroughly after handling.
- Use a local exhaust if dust or aerosol will be generated.

Advice on safe handling

- Handle in accordance with good industrial hygiene and safety practice.
- Vessel shouldn't be treated violently, such as rolling, shocking or dragging.

Storage

Storage conditions

- Keep container tightly closed. Store in a dark place under -20 degrees Celsius.
- Avoid long storage.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

Engineering controls

Install a closed system or local exhaust. Also install safety shower and eye bath.

Control parameters

Not set up

Personal protective equipment

Respiratory protection

Dust respirator

Hand protection

Protective gloves

Eye protection

Safety glasses.

Skin and body protection

Protective clothing. Protective boots, if the situation requires

## 9. PHYSICAL AND CHEMICAL PROPERTIES

(Dimethyl sulfoxide)	
Physical state (color/form)	colorless clear liquid
Odor	Odorless/ Irritating odor faintly
pH	No data available
Melting point/freezing point	18.5 °C
Boiling Point/Range	189 °C
Flash Point	95 °C / 203 °F
Explosive limits	Upper : 42.0 vol% Lower : 2.6 vol%
Vapor pressure	59.4
Vapor density	No data available
Density	1.099-1.103 g/mL (20 °C)
Decomposition temperature	No data available
Other Information	DAF-2 DA reacts with nitric oxide in present of oxygen and forms fluorescent triazole..

## 10. STABILITY AND REACTIVITY

(Dimethyl sulfoxide)	
Stability	Alerted by light.
Reactivity	None under normal processing.
Incompatible materials	Strong oxidizing agents, reducing agents
Hazardous Decomposition Products	Carbon monoxide (CO), Carbon dioxide (CO <sub>2</sub> ), Sulfur oxides (SO <sub>x</sub> )

## 11. TOXICOLOGICAL INFORMATION

(Dimethyl sulfoxide)	
Acute Toxicity	
Oral LD50	14,500 mg/kg (Rat)
Dermal LD50	N/A
Inhalation LC50	N/A
Skin corrosion/irritation	Rabbit; 500 mg/24H; mild
Serious eye damage/irritation	Rabbit; 500 mg/24H; mild
Respiratory or skin sensitization	No data available
Reproductive cell mutagenicity	No data available
Carcinogenicity	No data available
Reproductive toxicity	No data available
STOT-single exposure	No data available
STOT-repeated exposure	No data available
Aspiration hazard	No data available

## 12. ECOLOGICAL INFORMATION

Ecotoxicity effects	No information available
Mobility	No information available
Biodegradation	No information available
Bioaccumulation	No information available

## 13. DISPOSAL CONSIDERATIONS

Chemical materials	
• You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system.	
• Dispose of in accordance with local regulations	
Polluted vessels and package	
• Wash thoroughly before disposal.	

## 14. TRANSPORT INFORMATION

Hazards Class	Does not correspond to the classification standard of the United Nations
IATA	

Proper shipping name	Not classified as dangerous in the meaning of transport regulations
Hazard Class	No information available
Subsidiary Class	No information available
Packing group	No information available
UN-No	No information available

## 15. REGULATORY INFORMATION

(Dimethyl Sulfoxide)

International Inventories

EINECS/ELINCS	Listed
TSCA	Listed

Japanese regulations

Pollutant Release and Transfer Register Law	No
Industrial Safety and Health Act	No
Poisonous and Deleterious	No
Fire Service Act	Category IV, Class III petroleum, dangerous grade 3 water-soluble
Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc	No

## 16. OTHER INFORMATION

- International Chemical Safety Card (ICSC) database in Japanese (National Institute of Health Sciences)
  - This MSDS was prepared sincerely on the basis of the information we could obtained, however, any warranty shall not be given regarding the data contained and the assessment of hazards and toxicity.
  - Prior to use, please investigate not only the hazards and toxicity information but also the laws and regulations of the organization, area and country where the products are to be used.
  - Some new information or amendments may be added afterwards.
  - If the products are to be used far behind the expected time of use or if you have any questions, please feel free to contact us.
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