

# SAFETY DATA SHEET

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## DAP213

### 1. Identification of the Substance/Mixture and of the Company/Undertaking

Product Name: DAP213

Product Code: R-T073

Company Name of Supplier: ARK Resource Co., Ltd.

Address: 383-2 Nakahara-machi, Nishi-ku, Kumamoto-shi, Kumamoto, Japan

Telephone Number: 096-329-0880

FAX Number: 096-329-0882

Recommended Use and Restrictions on Use: For research use only. Not for use in diagnostic or therapeutic procedures.

### 2. Hazards Identification

GHS Classification

Physical and Chemical Hazards

Hazard Classification Element	Dimethyl sulfoxide	Acetamide	Propane-1,2-diol
Flammable Liquids	Category 4	Not classified / Not applicable (-)	Not classified / Not applicable (-)

Health Hazards

Hazard Classification Element	Dimethyl sulfoxide	Acetamide	Propane-1,2-diol
Carcinogenicity	Classification not possible	Category 2	Not classified
Reproductive Toxicity	Classification not possible	Category 2	Not classified
Specific Target Organ Toxicity (Single Exposure)	Category 2 (Respiratory system)	Classification not possible	Category 1 (Central nervous system, Blood system) Category 3 (Narcotic effects)
Specific Target Organ Toxicity (Repeated Exposure)	Not classified	Classification not possible	Category 1 (Central nervous system, Respiratory system)

Environmental Hazards

Hazard Classification Element	Dimethyl sulfoxide	Acetamide	Propane-1,2-diol
Hazardous to the Aquatic Environment (Acute)	-	Not classified	-
Hazardous to the Aquatic Environment (Long-Term)	-	Not classified	-

GHS Label Elements

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Pictograms or Symbols:



Signal Word: DANGER

Element	Dimethyl sulfoxide	Acetamide	Propane-1,2-diol
Hazard Statements	Combustible liquid. May cause damage to organs (Respiratory system).	Suspected of causing cancer. Suspected of damaging fertility or the unborn child.	Causes damage to organs (Central nervous system, Blood system). May cause drowsiness or dizziness. Causes damage to organs (Central nervous system, Respiratory system) through prolonged or repeated exposure.
Precautionary Statements: Prevention	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not breathe dust/fume/gas/mist/vapors/spray. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/clothing/eye protection/face protection.	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/clothing/eye protection/face protection.	Do not breathe dust/fume/gas/mist/vapors/spray. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product. Avoid breathing dust/fume/gas/mist/vapors/spray. Use only outdoors or in a well-ventilated area.
Precautionary Statements: Response	In case of fire: Use appropriate media to extinguish. If exposed or concerned: Call a physician	If exposed or concerned: Get medical advice/attention.	If exposed or concerned: Call a physician. If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a physician if you feel unwell. Get medical advice/attention if you feel unwell.
Precautionary Statements: Storage	-	-	Store in a well-ventilated place. Keep container tightly closed.
Precautionary Statements: Disposal	Dispose of contents/container should be in accordance with local/regional/national/international regulations.		
Other Hazards	-	-	-

### 3. Composition/Information on Ingredients

Substance/Mixture Distinction: Mixture

Chemical Name /	Chemical Formula	Weight	CAS RN	CSCL No.	ISHL No.
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Common Name		(%)		(Japan)	(Japan)
Dimethyl sulfoxide	(CH <sub>3</sub> ) <sub>2</sub> SO	15.6	67-68-5	(2)-1553	-
Acetamide	CH <sub>3</sub> CONH <sub>2</sub>	5.9	60-35-5	(2)-724	Existing Substance
Propane-1,2-diol	CH <sub>3</sub> CH(OH)CH <sub>2</sub> OH	22.8	57-55-6	(2)-234	Published

Impurities Contributing to GHS Classification: None

## 4. First-Aid Measures

Element	Dimethyl sulfoxide	Acetamide	Propane-1,2-diol
Inhalation	Move to a place with fresh air and keep comfortable for breathing. Call a physician.	Get medical advice/attention if you feel unwell.	Move to fresh air. If breathing is difficult, give oxygen. After inhalation of large amounts or in case of complaints, keep the affected person quiet and protect from hypothermia. Get medical advice/attention.
Skin Contact	Take off contaminated clothing. Rinse and then wash skin with water and soap. Call a physician.	Wash with soap and water. If skin irritation occurs: Get medical advice/attention.	Take off contaminated clothing. Rinse the affected skin area with running water for 10 to 20 minutes. Get medical advice/attention.
Eye Contact	Rinse with plenty of water for several minutes (remove contact lenses if easily possible). Call a physician.	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.	Rinse with running water for 10 minutes. Remove contact lenses if possible. Get medical advice/attention.
Ingestion	Do not induce vomiting. Call a physician.	Rinse mouth. Get medical advice/attention if you feel unwell.	Rinse mouth. Give one glass of water (approx. 200 mL). Do NOT induce vomiting. Get medical advice/attention.
Most Important Symptoms and Effects (acute or delayed)	Inhalation: Headache, nausea. Skin: May be absorbed; causes skin dryness. Eye: Redness, blurred vision. Ingestion: Nausea, vomiting, lethargy.	Skin: Redness, pain. Eye: Redness, pain.	Inhalation: Sore throat, cough. High concentrations of hot vapors/aerosols may cause slight irritation of the upper respiratory tract and breathing difficulties. Systemic toxic effects are unlikely. Skin: Slight redness or no local reaction. Rarely



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			<p>causes allergic reactions. Systemic effects are unlikely.</p> <p>Eye: Dryness, itching, pain, lacrimation, possible conjunctivitis.</p> <p>Ingestion: High doses may cause gastrointestinal symptoms (nausea, vomiting), systemic toxic effects.</p> <p>Absorption: After high doses, central nervous system symptoms such as headache, nausea, dizziness, impaired consciousness to coma, and in some cases convulsions may occur. Cardiac dysfunction (such as tachycardia, arrhythmia). In severe cases, renal dysfunction.</p>
Protection of First-Aiders	No information available		
Special Notes to Physician	No information available		

## 5. Fire-Fighting Measures

Element	Dimethyl sulfoxide	Acetamide	Propane-1,2-diol
Suitable Extinguishing Media	Water spray, alcohol-resistant foam, dry chemical, carbon dioxide (CO <sub>2</sub> ).	Water spray, alcohol-resistant foam, dry chemical, carbon dioxide (CO <sub>2</sub> ), dry sand.	Water spray, dry chemical, carbon dioxide (CO <sub>2</sub> ). For large fires, use alcohol-resistant foam or water spray.
Unsuitable Extinguishing Media	Do not use water jet (straight stream).	Do not use water jet (straight stream).	Do not use water jet (straight stream).
Specific Hazards	Combustible. Gives off irritating or toxic fumes (or gases) in a fire. Above 87°C, explosive vapor/air mixtures may be formed.	May ignite by heat, sparks, or flames. Burns vigorously when heated. May release irritating, corrosive, and toxic gases in a fire.	In case of fire, hazardous materials (carbon monoxide, carbon dioxide) may be released.



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Specific Fire-Fighting Procedures	Cool surrounding containers with water spray.	Move containers from fire area if you can do it without risk. Remove all sources of ignition if safe to do so.	Cool surrounding containers with water spray. If possible, remove containers from danger area. Heating increases pressure and creates a risk of bursting. Shut off all sources of ignition.
Special Protective Equipment	Wear self-contained breathing apparatus (SCBA) and protective clothing (heat resistant).	Wear appropriate self-contained breathing apparatus (SCBA) and full protective clothing (heat resistant).	Wear appropriate self-contained breathing apparatus (SCBA) and eye/skin protective clothing (heat resistant) during fire-fighting.

## 6. Accidental Release Measures

Element	Dimethyl sulfoxide	Acetamide	Propane-1,2-diol
Personal Precautions, Protective Equipment	Keep unnecessary personnel away. Ensure operators wear appropriate protective equipment to avoid contact with eyes, skin, and inhalation.	Eliminate all ignition sources. Isolate the leak area to an appropriate distance in all directions immediately. Keep unnecessary personnel out. Ventilate enclosed areas before entering.	Sufficient consideration must be given to preventing exposure (inhalation, dermal, and ingestion) of operational personnel.
Environmental Precautions	Avoid release to the environment due to potential impacts on the surrounding environment.	Do not release into the environment.	Hazard to the aquatic environment is low. If exceptionally large amounts enter water bodies, drains, sewers, or the ground, contact local authorities.
Methods for Containment and Cleaning Up	Personal protective equipment: Wear chemical protective clothing and a mask with an organic vapor filter according to airborne concentration. Ventilate area. Collect leaking liquid in sealable containers as much as possible. Absorb remaining liquid in sand or inert absorbent.	Recovery and Neutralization: Sweep up spilled material and collect into empty containers for later disposal. Containment and Cleaning: Moisten with water to reduce airborne dust and prevent scattering.	Eliminate all ignition sources (no smoking, flares, sparks or flames in the immediate area). Stop leak if you can do it without risk. For small spills, wipe up thoroughly with cloths, rags, etc., and collect into appropriate waste containers. For large spills, surround with an embankment to prevent spillage. Prevent entry into waterways, sewers, basements or confined areas.
Prevention of Secondary Hazards	-	Remove all ignition sources immediately (prohibit smoking,	No information available



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		sparks, or open flames nearby). Cover with plastic sheets to prevent dispersion.	
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## 7. Handling and Storage

### Handling

Element	Dimethyl sulfoxide	Acetamide	Propane-1,2-diol
Technical Measures	Implement engineering controls as specified in Section 8 and wear personal protective equipment. Provide local exhaust and general ventilation as detailed in Section 8.		Implement engineering controls as specified in Section 8 and wear personal protective equipment.
Precautions for Safe Handling	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not breathe dust/fume/gas/mist/vapors/spray. Do not eat, drink or smoke when using this product. Wear protective gloves/clothing/eye protection/face protection.	Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes.	Keep containers tightly closed when not in use. Ensure adequate ventilation during use. Use explosion-proof equipment, and take precautionary measures against static discharge. Prohibit the use of high-temperature objects, sparks, and open flames in the vicinity. Take precautionary measures against static discharge.
Avoidance of Contact	Refer to Section 10. Stability and Reactivity.		
Hygiene Measures	Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling.	Wash hands thoroughly after handling.	Wash skin with soap and water before breaks and at the end of work. Apply emollient skin care products after washing. Avoid breathing vapor or mist. Do not eat, drink or smoke when using this product.

Safe Storage Conditions: Confirm storage conditions indicated on the product label.

Safe Packaging Materials: Glass

## 8. Exposure Controls/Personal Protection

Element	Dimethyl sulfoxide	Acetamide	Propane-1,2-diol
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Occupational Exposure Limits	Not established	Not established	-
Acceptable Concentration	Not established	Not established	-
Engineering Controls	Above 87°C, use a closed system, local exhaust ventilation, explosion-proof electrical equipment, and lighting equipment. Use general or local exhaust ventilation.	Install eyewash stations and safety showers in facilities where this material is stored or handled. Use enclosed equipment or local exhaust ventilation to prevent exposure.	Install appropriate ventilation equipment in the workplace. Provide washing facilities near the handling area. Ensure the floor is non-slip.
Respiratory Protection	Wear appropriate respirator or mask as required.	Wear appropriate respiratory protection.	Use appropriate respiratory protection depending on the situation and requirements.
Hand Protection	Wear protective gloves.	Wear appropriate protective gloves.	Wear protective gloves (Natural rubber, chloroprene, nitrile rubber, butyl rubber, fluorine rubber, and PVC are suitable).
Eye Protection	Wear safety glasses.	Wear appropriate eye protection.	Wear safety glasses with side shields.
Skin and Body Protection	Wear protective clothing.	Wear appropriate protective clothing.	Wear an apron or laboratory coat.

## 9. Physical and Chemical Properties

Physical State: Liquid

Color: Clear, colorless

Odor: Odorless

Melting Point/Freezing Point: No data available

Boiling Point/Range: No data available

Flammability: No data available

Explosion Limits (Lower/Upper): No data available

Flash Point: No data available

Auto-Ignition Temperature: No data available

Decomposition Temperature: No data available

pH: 7.5 – 8.0

Kinematic Viscosity: No data available

Solubility in Water: Soluble

n-Octanol/Water Partition Coefficient: No data available

Vapor Pressure: No data available

Density / Relative Density: No data available

Relative Gas Density: No data available



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Particle Characteristics: No data available

## 10. Stability and Reactivity

Element	Dimethyl sulfoxide	Acetamide	Propane-1,2-diol
Reactivity	Refer to 'Possibility of Hazardous Reactions'.	Considered stable under normal storage and handling conditions.	Refer to 'Possibility of Hazardous Reactions'.
Chemical Stability	No information available	Considered stable under normal storage and handling conditions.	Reacts violently with strong oxidizing agents and alkalis.
Possibility of Hazardous Reactions	Decomposes on heating or burning, producing toxic fumes including sulfur oxides. Reacts violently with strong oxidants such as perchlorates.	Decomposes on burning, producing toxic fumes (nitrogen oxides, etc.). Reacts with strong acids and strong oxidizing agents.	This substance may react dangerously with oxidizing agents, acid anhydrides, and acid chlorides.
Conditions to Avoid	Contact with incompatible materials.	Combustion.	Open flames, heating, high temperatures, static electricity, sparks, and formation of explosive mixtures.
Incompatible Materials	Strong oxidizing agents	Strong acids, strong oxidizing agents	Oxidizing substances, acid chlorides, acid anhydrides, chloroformates, reducing agents
Hazardous Decomposition Products	Toxic fumes such as sulfur oxides	Nitrogen oxides	No information available

## 11. Toxicological Information

Element	Dimethyl sulfoxide	Acetamide	Propane-1,2-diol
Acute Toxicity: Oral	Not classified	Not classified	Not classified
Acute Toxicity: Dermal	Not classified	Classification not possible	Not classified
Acute Toxicity: Inhalation (Gas)	Liquid according to GHS definition	Solid according to GHS definition	Liquid according to GHS definition
Acute Toxicity: Inhalation (Vapor)	Classification not possible	Solid according to GHS definition	Classification not possible
Acute Toxicity: Inhalation (Dust/Mist)	Not classified	Classification not possible	Classification not possible
Skin Corrosion/Irritation	Not classified	Classification not possible	Not classified
Serious Eye Damage/Irritation	Not classified	Classification not possible	Not classified
Respiratory Sensitization	Classification not possible		
Skin Sensitization	Not classified	Classification not possible	Not classified
Germ Cell Mutagenicity	Not classified	Classification not possible	Classification not possible
Carcinogenicity	Classification not possible	Category 2	Classification not possible
Reproductive Toxicity	Classification not possible	Category 2	Classification not possible



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STOT - Single Exposure	Category 2 (Respiratory system)	Classification not possible	Category 1 (Central nervous system, Blood system) Category 3 (Narcotic effects)
STOT - Repeated Exposure	Not classified	Classification not possible	Category 1 (Central nervous system, Respiratory system)
Aspiration Hazard	Classification not possible	Classification not possible	Classification not possible

## 12. Ecological Information

Element	Dimethyl sulfoxide	Acetamide	Propane-1,2-diol
Acute Aquatic Hazard	-	Not classified	Not classified
Chronic Aquatic Hazard	-	Not classified	Not classified
Persistence / Degradability	-	-	CSCL Biodegradation Test: Readily biodegradable
Bioaccumulative Potential	-	-	No information available
Mobility in Soil	-	-	No information available
Hazardous to the Ozone Layer	This substance is not listed in the Annexes to the Montreal Protocol.	This substance is not listed in the Annexes to the Montreal Protocol.	This substance is not listed in Annexes A-C and E to the Montreal Protocol.

## 13. Disposal Considerations

Waste from Residues: Dispose of contents/container should be in accordance with local/regional/national/international regulations.

Contaminated Packaging: Completely empty containers before disposal. Empty containers should be taken to an approved waste handling site for recycling or disposal.

## 14. Transport Information

*The applicability of transport regulations may vary depending on the product configuration. Information will be modified in accordance with the regulatory testing information and the environmental impact information in Section 12, as required.*

### International Regulations

Element	Dimethyl sulfoxide	Acetamide	Propane-1,2-diol
UN Number	Not applicable	Not applicable	-
UN Proper Shipping Name	Not applicable	-	-
Transport Hazard Class(es)	Not applicable	-	-
Subsidiary Risk	Not applicable	-	-
Packing Group	Not applicable	-	-
Marine Pollutant	Not applicable	-	-



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Transport in Bulk (MARPOL 73/78)	Not applicable
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## Domestic Regulations (Japan)

Element	Dimethyl sulfoxide	Acetamide	Propane-1,2-diol
Marine Regulations Information	Not applicable	Not applicable	Not applicable
Aviation Regulations Information	Not applicable	Not applicable	Not applicable
Land Regulations Information	Comply with the provisions of the Fire Service Act.	Not applicable	Comply with the provisions of the Fire Service Act.

Element	Dimethyl sulfoxide	Acetamide	Propane-1,2-diol
Special Safety Precautions	Subject to the requirement to carry an Emergency Response Card (Yellow Card) under the Fire Service Act.	Do not transport with food or animal feed.	Subject to the requirement to carry an Emergency Response Card (Yellow Card) under the Fire Service Act.
Other (General) Precautions	During transport, avoid direct sunlight, load properly to prevent container damage, corrosion, or leakage, and ensure robust load collapse prevention. Do not stack heavy objects on top.		
Emergency Response Guide Number	Not applicable		

## 15. Regulatory Information

Regulatory information is provided based on the date of creation. When utilizing this information at a workplace, please verify the latest regulations.

Law / Regulation	Dimethyl sulfoxide	Acetamide	Propane-1,2-diol
Industrial Safety and Health Act (ISHL)	Not applicable	Dangerous and Harmful Substances Whose Names Are to Be Indicated (Article 57, Paragraph 1, Enforcement Order Article 18, Ordinance Appended Table 9) Dangerous and Harmful Substances Whose Names Are to Be Notified (Article 57-2, Enforcement Order Article 18-2, Ordinance Appended Table 9) Substances Subject to Risk Assessment (Article 57-3)	Dangerous and Harmful Substances Whose Names Are to Be Indicated (Article 57, Paragraph 1, Enforcement Order Article 18, Ordinance Appended Table 2) (Effective from April 1, 2025) Dangerous and Harmful Substances Whose Names Are to Be Notified (Article 57-2, Enforcement Order Article 18-2, Ordinance Appended Table 2) (Effective from April 1, 2025) Substances Subject to Risk Assessment (Article 57-3) (Effective from April 1, 2025)



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			Obligation for Workplace Labeling (Article 101-4) (Effective from April 1, 2025)
PRTR Law	Not applicable	Class 2 Designated Chemical Substance	-
Poisonous and Deleterious Substances Control Act	Not applicable	-	-
Labor Standards Act	-	-	-
Chemical Substances Control Law (CSCL)	-	-	Priority Assessment Chemical Substance (Article 2, Paragraph 5)
Fire Service Act	Group 4, Flammable liquids, Class III petroleum, Water-soluble liquids (Article 2, Paragraph 7, Dangerous Goods Appended Table 1, Group 4)	-	Group 4, Flammable liquids, Class III petroleum, Water-soluble liquids (Article 2, Paragraph 7, Dangerous Goods Appended Table 1, Group 4)

## 16. Other Information

### References and Reference Websites:

EMERGENCY RESPONSE GUIDEBOOK (US DOT)

International Chemical Safety Cards (ICSC)

MERCK INDEX

Comprehensive Chemical Dictionary (Kyoritsu Shuppan)

The Registry of Toxic Effects of Chemical Substances (RTECS)

National Institute of Technology and Evaluation (NITE)

Chemical Risk Information Platform (CHRIP)

Japan Chemical Database Ltd.

GHS Classification Results (NITE, "Anzen-Site" for workplaces)

### Limitation of Liability:

This product is a research reagent and cannot be used for any other purpose. The contents of this document are prepared based on materials, information, and data currently available, and may be revised based on new findings. Furthermore, the precautionary statements apply only to normal handling. In the case of special handling, please implement sufficient safety measures before use.

