

## Material Safety Data Sheet

Version 2.3

Revision Date 4/21/23

### 1. PRODUCT AND COMPANY IDENTIFICATION

Product name:

co-[DMA, NAS, MAPS] dissolved in in Dimethylformamide

Product number: MCP-2

Company: Lucidant Polymers, LLC  
1230 Bordeaux Dr.  
Sunnyvale, CA 94089-1202  
Telephone: 408-569-8607  
Emergency Phone #: 408-569-8607

### 2. HAZARDS IDENTIFICATION

#### 2.1 Classification of the substance or mixture

**GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**  
**DMF (dimethylformamide):**

**Flammable Liquids (Category 3)**

**Acute Toxicity, Inhalation (Category 4)**

**Acute Toxicity, Dermal (Category 4)**

**Eye Irritation (Category 2A)**

**Carcinogenicity (Category 1B)**

**Reproductive Toxicity (Category 1B)**

#### Potential Health Effects

Inhalation May be harmful if inhaled. May cause respiratory tract irritation.  
Skin May be harmful if absorbed through skin. May cause skin irritation.  
Eyes May cause eye irritation.  
Ingestion May be harmful if swallowed.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

Formula: copolymer- (DMA)<sub>n</sub> - (NAS)<sub>m</sub> - (MAPS)<sub>p</sub>, dissolved in dimethylformamide (DMF)  
Molecular Weight: approx. 1,000,000 g/mol

CAS-No.	EC No.	Index-No.	Concentration
co-[DMA, NAS, MAPS]	-	-	0.36g/mL
dimethylformamide (68-12-2)	200-679 -5	-	-

## **4. FIRST AID MEASURES**

### **If inhaled**

If breathed in, move person into fresh air. If not breathing, give artificial respiration.

### **In case of skin contact**

Wash off with soap and rinse immediately with plenty of water.

### **In case of eye contact**

Flush eyes with water as a precaution.

### **If swallowed**

Never give anything by mouth to an unconscious person. Rinse mouth with water.

## **5. FIRE-FIGHTING MEASURES**

### **Flammable properties**

Flash point                      no data available

Ignition temperature        no data available

### **Suitable extinguishing media**

water spray, alcohol-resistant foam, carbon dioxide, dry chemical

### **Special protective equipment for fire-fighters**

Wear self-contained breathing apparatus for fire fighting if necessary.

## **6. ACCIDENTAL RELEASE MEASURES**

### **Personal precautions**

Avoid breathing vapors, mist or gas.

### **Environmental precautions**

Do not let product enter drains.

### **Methods and materials for containment and cleaning up**

Keep in suitable, closed containers for disposal.

## **7. HANDLING AND STORAGE**

### **Precautions for safe handling**

Use only in area provided with appropriate exhaust ventilation. Wear personal protective equipment for liquid handling, and operate under a fume hood.

### **Conditions for safe storage**

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Recommended storage temperature: -20°C or lower

**MSDS: Copoly-(N,N-dimethylacrylamide, N,N acryloylsuccinimide, and 3-(trimethoxysilyl) propyl methacrylate (co-[DMA, NAS, MAPS])**

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## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
N,N-dimethylformamide	68-12-2	Total N-Methylformamide	30 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			
		N-Acetyl-S-(N-methylcarbonyl) cysteine	30 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift at end of workweek			

### Derived No Effect Level (DNEL)

Application Area	Routes of exposure	Health effect	Value
Workers	Skin contact	Acute systemic effects	26.3mg/kg BW/d
Workers	Inhalation	Acute systemic effects	30 mg/m <sup>3</sup>
Workers	Skin contact	Long-term systemic effects	3.31mg/kg BW/d
Workers	Inhalation	Long-term systemic effects	15 mg/m <sup>3</sup>

### Predicted No Effect Concentration (PNEC)

Compartment	Value
Water	30 mg/l
Soil	16.235 mg/kg
Sea water	3 mg/kg
Fresh water	30 mg/l
Fresh water sediment	25.05 mg/kg
Onsite sewage treatment plant	123 mg/l

### Personal protective equipment

#### Respiratory protection

Respiratory protection is not required except when handling dry powder. Wear dust masks.

#### Hand protection

Use protective gloves.

#### Eye protection

Wear safety glasses.

#### Skin and body protection

Observe general industrial hygiene practice.

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## **9. PHYSICAL AND CHEMICAL PROPERTIES**

### **9.1 Information on basic physical and chemical properties**

a) Appearance	Form: liquid, clear Color: colorless
b) Odor	amine-like
c) Odor Threshold	0.329 ppm
d) pH	7 at 200 g/l at 20 °C (68 °F)
e) Melting point/freezing point	Melting point/range: -61 °C (-78 °F)
f) Initial boiling point and boiling range	153 °C 307 °F
g) Flash point	57.5 °C (135.5 °F) - closed cup - DIN 51755 Part 2
h) Evaporation rate	No data available
i) Flammability (solid, gas)	No data available
j) Upper/lower flammability or explosive limits	Upper explosion limit: 16 %(V) Lower explosion limit: 2.2 %(V)
k) Vapor pressure	3.77 hPa at 20 °C (68 °F)
l) Vapor density	2.52 - (Air = 1.0)
m) Density	0.944 g/mL
Relative density	No data available
n) Water solubility	1,000 g/l at 20 °C (68 °F)completely miscible
o) Partition coefficient: n-octanol/water	log Pow: -0.85 at 25 °C (77 °F) - Bioaccumulation is not expected.
p) Autoignition temperature	435 °C (815 °F) at 1,013 hPa - DIN 51794
q) Decomposition temperature	> 350 °C (> 662 °F) -
r) Viscosity	No data available
s) Explosive properties	No data available
t) Oxidizing properties	none

### **9.2 Other safety information**

Relative vapor density	2.52 - (Air = 1.0)
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## **10. STABILITY AND REACTIVITY**

### **Chemical stability**

Stable under ambient conditions (room temperature) and in cold storage (-80C, -20C, 4C).

### **Conditions to avoid**

Keep away from open flames, hot surfaces, and sources of ignition.

### **Materials to avoid**

Strong oxidizing agents, copper, copper alloys, tin, various plastics.

### **Hazardous decomposition products**

Hazardous decomposition products formed under fire conditions: carbon oxides.

## **11. TOXICOLOGICAL INFORMATION**

### **11.1 Information on toxicological effects**

#### **Acute toxicity**

LD50 Oral - Rat - male and female - 3,010 mg/kg

(OECD Test Guideline 401)

Acute toxicity estimate Inhalation - 4 h - 11.1 mg/l - vapor

(Expert judgment)

Remarks: (Regulation (EC) No 1272/2008, Annex VI)

LD50 Dermal - Rabbit - 1,500 mg/kg

Remarks: (Regulation (EC) No 1272/2008, Annex VI)

(IUCLID)

#### **Skin corrosion/irritation**

Skin - Rabbit

Result: No skin irritation - 20 h

Remarks: (ECHA)

#### **Serious eye damage/eye irritation**

Eyes - Rabbit

Result: Irritating to eyes.

(OECD Test Guideline 405)

Remarks: (Regulation (EC) No 1272/2008, Annex VI)

#### **Respiratory or skin sensitization**

Local lymph node assay (LLNA) - Mouse

Result: negative

(OECD Test Guideline 406)

#### **Germ cell mutagenicity**

Test Type: sister chromatid exchange assay

Test system: Chinese hamster ovary cells

Metabolic activation: with and without metabolic activation

Result: negative

Remarks: (ECHA)

Test Type: unscheduled DNA synthesis assay

Test system: human diploid fibroblasts

Metabolic activation: with and without metabolic activation

Result: negative

Remarks: (ECHA)

Test Type: Ames test

Test system: Salmonella typhimurium

Metabolic activation: with and without metabolic activation

Result: negative

Remarks: (ECHA)

Test Type: Micronucleus test

Species: Mouse

Cell type: Bone marrow

Application Route: Intraperitoneal injection

Result: negative

Remarks: (ECHA)

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**Carcinogenicity**

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

**Reproductive toxicity**

May damage the unborn child.

**Specific target organ toxicity - single exposure**

No data available

**Specific target organ toxicity - repeated exposure**

No data available

**Aspiration hazard**

No data available

**Additional Information**

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. Poly DMA-MAPS-NAS is nontoxic. However, trace residual acrylamide monomer is a neurotoxin and is a suspected carcinogen. Residual dimethylacrylamide and other monomers have been removed from this product by a series of extraction steps, so their content is minimized, and the biggest hazard to an operator using this product would be Dimethylformamide solution.

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## 12. ECOLOGICAL INFORMATION

### 12.1 Toxicity

Toxicity to fish	flow-through test LC50 - Lepomis macrochirus (Bluegill sunfish) - 7,100 mg/l - 96 h (US-EPA)
Toxicity to daphnia and other aquatic invertebrates	static test EC50 - Daphnia magna (Water flea) - 13,100 mg/l - 48 h (OECD Test Guideline 202)
Toxicity to algae	static test ErC50 - Desmodesmus subspicatus (green algae) - > 1,000 mg/l - 72 h (DIN 38412)
Toxicity to bacteria	static test EC50 - Vibrio fischeri - 12,300 - 17,500 mg/l - 5 min Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates(Chronic toxicity)	semi-static test NOEC - Daphnia magna (Water flea) - 1,500 mg/l - 21 d Remarks: (ECHA)

### 12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 21 d Result: 100 % - Readily biodegradable. (OECD Test Guideline 301E)
Biochemical Oxygen Demand (BOD)	900 mg/g Remarks: (Lit.)
Theoretical oxygen demand	1,863 mg/g Remarks: (Lit.)

### 12.3 Bioaccumulative potential

Bioaccumulation	Cyprinus carpio (Carp) - 56 d at 25 °C - 0.002 mg/l(N,N-dimethylformamide)  Bioconcentration factor (BCF): 0.3 - 1.2 (OECD Test Guideline 305C)  Remarks: Does not significantly accumulate in organisms.
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## 13. DISPOSAL CONSIDERATIONS

### Product

Observe all federal, state, and local environmental regulations.

### Contaminated packaging

Rinse thoroughly to remove all product, dispose of rinse water in accordance with local regulations.

## 14. TRANSPORT INFORMATION

Dimethylformamide (DMF) in solution – this product is shipped according to packaging specifications outlined for DMF

### DOT (US)

UN number: 2265    Class: 3    Packing group: III  
Proper shipping name: N,N-Dimethylformamide  
Reportable Quantity (RQ): 100 lbs  
Poison Inhalation Hazard: No

### IMDG

UN number: 2265    Class: 3    Packing group: III    EMS-No: F-E, S-D  
Proper shipping name: N,N-DIMETHYLFORMAMIDE

### IATA

UN number: 2265    Class: 3    Packing group: III  
Proper shipping name: N,N-Dimethylformamide

## **15. REGULATORY INFORMATION**

### **OSHA Hazards**

No known OSHA hazards

### **TSCA Status**

Not on TSCA Inventory

### **DSL Status**

This chemical is not on the Canadian DSL list.

### **SARA 302 Components**

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

### **SARA 313 Components**

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

### **SARA 311/312 Hazards**

No SARA Hazards

### **Massachusetts Right To Know Components**

No components listed.

### **Pennsylvania Right To Know Components**

No components listed.

### **New Jersey Right To Know Components**

No components listed.

### **California Prop. 65 Components**

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

## **16. OTHER INFORMATION**

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Lucidant Polymers, LLC, shall not be held liable for any damage resulting from handling or from contact with the above product.