SAFETY DATA SHEET

Celanese

PE311

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This SDS adheres to the standards and regulatory requirements of China and may not meet the regulatory requirements in other countries.

Section 1 - Chemical and Enterprise Identification

Product name : PE311

Product name in English : PE311

Recommended use of the chemical and restriction on use

Recommended use : For industrial use only.
Paste for electronic industry

Restrictions on use : Do not use product for anything outside of the above specified uses.

Manufacturer, importer, supplier

Company : Celanese (Shanghai) International Trading Co., Ltd
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Date of first preparation : 2018/04/17

Section 2 - Hazard Identification

GHS Hazard Category

Acute aquatic toxicity : Category 1
Chronic aquatic toxicity : Category 1
Endpoints which are not classified, cannot be classified or are not applicable are not shown.

Label content

Pictogram :

Signal word : Warning

Hazardous warnings : Very toxic to aquatic life with long lasting effects.

Precautionary statements : **Preventive Measures:**
Avoid release to the environment.
Accident Response:
Collect spillage.
Safe Storage: No precautionary statements are applicable for Safe Storage.

Waste Disposal:
Dispose of contents/ container to an approved waste disposal plant.

Main Symptom After Contact
No information available.

Section 3 - Ingredients/Composition Information

Chemical nature : Mixture

Components

Chemical name	CAS-No.	Concentration
Silver powder	7440-22-4	50 - 60%
(2-Methoxymethylethoxy)propanol	34590-94-8	20 - 30%
2-(2-Ethoxyethoxy)ethyl acetate	112-15-2	1 - 10%

Section 4 - First-aid Measures

Inhalation : If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.

Skin contact : Wash off with soap and water. Get medical attention if irritation develops and persists. Wash contaminated clothing before re-use.

Eye contact : Immediately flush eyes for at least 15 minutes. Get medical attention.

Ingestion : If swallowed Rinse mouth with water. Call a physician or poison control centre immediately. DO NOT induce vomiting unless directed to do so by a physician or poison control center.

Most important symptoms/effects, acute and delayed : No information available.

Protection of first-aiders : No information available.

Notes to physician : No information available.

Section 5 - Fire-fighting Measures

Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Water spray, Dry chemical, Carbon dioxide (CO2)

Specific hazards : Hazardous decomposition products formed under fire conditions. (see also section 10) Avoid breathing decomposition products.

Special protective equipment for firefighters : Exposure to decomposition products may be a hazard to health. Wear self-contained breathing apparatus for firefighting if necessary.

Specific extinguishing methods	:	No information available.
Further information	:	Evacuate personnel to safe areas. Stop spill/release if it can be done with minimal risk. Do not allow run-off from fire fighting to enter drains or water courses.

Section 6 - Leak Emergency Treatment

Protective measures, devices and emergency treatment procedure for workers	:	Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. Wear suitable protective equipment.
Environmental precautions	:	Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Clean contaminated floors and objects thoroughly while observing environmental regulations.
Methods and materials for containment and cleaning up	:	Contain spill. Soak up with inert absorbent material. Collect and contain contaminated absorbent and dike material for disposal. Keep in suitable, closed containers for disposal. Ventilate the area. Clean contaminated surface thoroughly.
Prevention of secondary hazards	:	No information available.
Additional advice	:	Dispose of in accordance with local regulations.

Section 7 - Operation Handling and Storage

Operation Handling

Technical measures/Precautions	:	Avoid inhalation, ingestion and contact with skin and eyes. Do not use in areas without adequate ventilation. Keep container closed when not in use. Take care to avoid waste and spillage when weighing, loading and mixing the product.
Precautions for safe handling	:	Avoid formation of dust and aerosols. Keep away from heat and sources of ignition.

Storage

Suitable storage conditions	:	Store in original container. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from sources of ignition - No smoking. Do not store or consume food, drink or tobacco in areas where they may become contaminated with this material. Keep container closed when not in use. Do not reuse empty container. Storage period: Stable under normal conditions.

Section 8 - Exposure Control and Personal Protection

Control parameters

Applicable occupational exposure limits are listed below.

Chemical name	Occupational Exposure Limits	Regulation
Silver powder		
TWA	0.1 mg/m3 (Dust and fume.)	US ACGIH
(2-Methoxymethylethoxy)propanol		
STEL	900 mg/m3	GBZ 2.1
	Can be absorbed through skin.	GBZ 2.1
TWA	600 mg/m3	GBZ 2.1
TWA	100 ppm	US ACGIH
	Can be absorbed through skin.	US ACGIH
STEL	150 ppm	US ACGIH

Engineering controls : Local exhaust or a laboratory hood should be used when handling the materials. Maintain air concentrations below occupational exposure standards.

Biological occupational exposure limits : No information available.

Personal protective equipment

Respiratory protection : Provide adequate ventilation. No personal respiratory protective equipment normally required. Where there is potential for airborne exposures in excess of applicable limits, wear approved respiratory protection with dust/mist cartridge. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Consult the respirator manufacturer to determine the appropriate type of equipment for a given application. Observe respirator use limitations specified by the manufacturer.
Persons performing maintenance or repairs on exhaust system equipment (e.g. ducts) may need to use respirators and protective clothing to prevent exposure to any accumulated residues.

Hand protection : Material: Impervious gloves
Gloves must be inspected prior to use., Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough., The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other., The exact break through time can be obtained from the protective glove producer and this has to be observed., Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.

Eye protection : Wear safety glasses with side shields.

Skin protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.
Lightweight protective clothing
Safety shoes

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothing. Contaminated work clothing should not be allowed out of the workplace. Remove contaminated clothing and protective equipment before entering eating areas. Remove and wash contaminated clothing before re-use.

Section 9 - Physical and Chemical Properties

Appearance (Physical state, form, colour, etc.)
Physical state : liquid
Form : viscous liquid
Colour : grey

Odour : solvent-like

Odour Threshold : No information available.

pH : No information available.

Melting point/freezing point
No information available.

Boiling point, initial boiling point and boiling range
No information available.

Flash point : 107 °C
Method: Setaflash closed cup - SCC

Evaporation rate : No information available.

Flammability (solid, gas) : No information available.

Upper/lower flammability or explosive limits
Upper explosion limit : No information available.
Lower explosion limit : No information available.

Vapour pressure : No information available.

Vapour density : No information available.

Density
Density : 2.12 g/cm3

Solubility(ies)
Water solubility : (20 °C)
insoluble

Partition coefficient: n-octanol/water : No information available.

Auto-ignition temperature
No information available.

Decomposition temperature : No information available.

Viscosity
Viscosity, kinematic : No information available.

Molecular weight : No information available.

Section 10 - Stability and Reactivity

Reactivity : No information available.

Chemical stability : Stable at normal temperatures and storage conditions.

Possibility of hazardous reactions : Polymerization will not occur.

Conditions to avoid : None reasonably foreseeable.

Materials to avoid : Acids, bases and strong oxidizing agents

Hazardous decomposition products : No decomposition if stored and applied as directed.

Under fire conditions:

Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke)., Metal oxides

Section 11 - Toxicological Information

Acute toxicity

Oral

Silver powder	:	LD50/Rat: > 2,000 mg/kg Method: OECD Test Guideline 401 The substance or mixture has no acute oral toxicity
(2-Methoxymethylethoxy)propanol	:	LD50/Rat: 5,180 mg/kg
2-(2-Ethoxyethoxy)ethyl acetate	:	LD50/Rat: 11,000 mg/kg The substance or mixture has no acute oral toxicity

Inhalation

Silver powder	:	LC50/4 h/Rat(dust/mist): > 5.16 mg/l Method: OECD Test Guideline 436 The substance or mixture has no acute inhalation toxicity
(2-Methoxymethylethoxy)propanol	:	Acute toxicity estimate/4 h/Rat(vapour): > 20 mg/l The substance or mixture has no acute inhalation toxicity An LC50/inhalation/4h/rat could not be determined because no mortality of rats was observed at the maximum achievable concentration.
2-(2-Ethoxyethoxy)ethyl acetate	:	LC50/4 h/Rat(vapour) The substance or mixture has no acute inhalation toxicity An LC50/inhalation/4h/rat could not be determined because no mortality of rats was observed at the maximum achievable concentration.

Dermal

Silver powder	:	LD50/Rat: > 2,000 mg/kg Method: OECD Test Guideline 402

The substance or mixture has no acute dermal toxicity
Information given is based on data obtained from similar substances.

(2-Methoxymethylethoxy)propanol : LD50/Rabbit: 9,500 mg/kg

2-(2-Ethoxyethoxy)ethyl acetate : LD50/Rabbit: 15,300 mg/kg
The substance or mixture has no acute dermal toxicity

Skin corrosion/irritation

Silver powder : Species: Rabbit
Result: No skin irritation
Classification: No skin irritation
Method: OECD Test Guideline 404

(2-Methoxymethylethoxy)propanol : Species: Rabbit
Result: No skin irritation
Classification: Not classified as irritant

2-(2-Ethoxyethoxy)ethyl acetate : Species: Rabbit
Result: No skin irritation
Classification: No skin irritation
Method: OECD Test Guideline 404
Minimal effects that do not meet the threshold for classification.

Serious eye damage/eye irritation

Silver powder : Species: Rabbit
Result: No eye irritation
Classification: No eye irritation
Method: OECD Test Guideline 405

(2-Methoxymethylethoxy)propanol : Species: Rabbit
Result: slight irritation
Classification: Not classified as irritant

2-(2-Ethoxyethoxy)ethyl acetate : Species: Rabbit
Result: Irritation to eyes, reversing within 7 days
Classification: Mild eye irritation

Respiratory or skin sensitisation

Silver powder : Species: Guinea pig
Result: Does not cause skin sensitisation.
Classification: Does not cause skin sensitisation.
Method: OECD Test Guideline 406
Information given is based on data obtained from similar substances.

(2-Methoxymethylethoxy)propanol : Species: human
Result: Patch test on human volunteers did not demonstrate sensitisation properties.
Classification: Not a skin sensitizer.

2-(2-Ethoxyethoxy)ethyl acetate : Species: Guinea pig
Result: Does not cause skin sensitisation.
Classification: Does not cause skin sensitisation.
Method: OECD Test Guideline 406

Germ cell mutagenicity

Silver powder : Weight of evidence does not support classification as a germ cell mutagen. Overall weight of evidence indicates that the substance is not mutagenic. Information given is based on data obtained from similar substances.

(2-Methoxymethylethoxy)propanol : Tests on bacterial or mammalian cell cultures did not show mutagenic effects. Evidence suggests this substance does not cause genetic damage in animals.

2-(2-Ethoxyethoxy)ethyl acetate : Animal testing did not show any mutagenic effects. Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

Carcinogenicity

Silver powder : Weight of evidence does not support classification as a carcinogen
Overall weight of evidence indicates that the substance is not carcinogenic.

(2-Methoxymethylethoxy)propanol : Not classifiable as a human carcinogen.
Animal testing did not show any carcinogenic effects.
Information given is based on data obtained from similar substances.

Reproductive toxicity

Silver powder : Teratogenicity: Animal testing showed no developmental toxicity.
Information given is based on data obtained from similar substances.

(2-Methoxymethylethoxy)propanol : Reproductive toxicity: No toxicity to reproduction
Animal testing showed no reproductive toxicity.
Information given is based on data obtained from similar substances.
Teratogenicity: Animal testing showed no developmental toxicity.

2-(2-Ethoxyethoxy)ethyl acetate : Reproductive toxicity: No toxicity to reproduction
Animal testing showed no reproductive toxicity.
No effects on or via lactation
Information given is based on data obtained from similar substances.
Teratogenicity: Animal testing showed no developmental toxicity.
Information given is based on data obtained from similar substances.

Specific Target Organ Toxicity

Specific target organ toxicity - single exposure

Silver powder : The substance or mixture is not classified as specific target organ toxicant, single exposure.

2-(2-Ethoxyethoxy)ethyl acetate : The substance or mixture is not classified as specific target organ toxicant, single exposure.

Specific target organ toxicity - repeated exposure

Silver powder : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

2-(2-Ethoxyethoxy)ethyl acetate : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration hazard

Silver powder : No aspiration toxicity classification

2-(2-Ethoxyethoxy)ethyl acetate : No aspiration toxicity classification

Other

Silver powder : Repeated dose toxicity:
Ingestion/Rat 30 d
NOAEL: 150 mg/kg

No toxicologically significant effects were found., Information given is based on data obtained from similar substances.

(2-Methoxymethylethoxy)propanol : Repeated dose toxicity:
Oral/Rat
No toxicologically significant effects were found.
Inhalation/multiple species
No toxicologically significant effects were found.
Dermal/Rabbit 90 d
Skin irritation

2-(2-Ethoxyethoxy)ethyl acetate : Repeated dose toxicity:
Ingestion/Rat 90 d
NOAEL: 250 mg/kg
Method: OECD Test Guideline 408
No toxicologically significant effects were found., Information given is based on data obtained from similar substances.
Inhalation/Rat 28 d dust/mist
NOAEL: 1.1 mg/l
LOAEL: > 1.1 mg/l
No toxicologically significant effects were found., Information given is based on data obtained from similar substances.

Section 12 - Ecological Information

Ecotoxicity effects

Acute and prolonged toxicity to fish

Silver powder : LC50/96 h/Fish (unspecified species): 0.107 mg/l
Method: OECD Test Guideline 203
Information given is based on data obtained from similar substances.

(2-Methoxymethylethoxy)propanol : LC50/96 h/Pimephales promelas (fathead minnow): > 10,000 mg/l

2-(2-Ethoxyethoxy)ethyl acetate : LC50/96 h/Danio rerio (zebra fish): > 100 mg/l
Method: OECD Test Guideline 203

Toxicity to aquatic plants

Silver powder : EC50/96 h/Pseudokirchneriella subcapitata (green algae): 0.19 mg/l
Information given is based on data obtained from similar substances.
NOEC/14 d/Algae: 0.0012 mg/l
Information given is based on data obtained from similar substances.

(2-Methoxymethylethoxy)propanol : ErC50/72 h/Selenastrum capricornutum (green algae): > 969 mg/l

2-(2-Ethoxyethoxy)ethyl acetate : EC50/72 h/Algae: 110.2 mg/l
Method: OECD Test Guideline 201
NOEC/72 h/Pseudokirchneriella subcapitata (green algae): 300 mg/l
Method: ISO 8692
Information given is based on data obtained from similar substances.

Acute toxicity to aquatic invertebrates

Silver powder : EC50/48 h/Ceriodaphnia dubia (water flea): 0.16 mg/l
Information given is based on data obtained from similar substances.

(2-Methoxymethylethoxy)propanol : EC50/48 h/Daphnia magna (Water flea): 1,919 mg/l

2-(2-Ethoxyethoxy)ethyl acetate : LC50/48 h/Daphnia magna (Water flea): 143 mg/l

Chronic toxicity to fish

Silver powder	:	NOEC/32 d/Oncorhynchus mykiss (rainbow trout): 0.0012 mg/l Information given is based on data obtained from similar substances.
2-(2-Ethoxyethoxy)ethyl acetate	:	NOEC/28 d/Fish (unspecified species): 28.64 mg/l

Chronic toxicity to aquatic Invertebrates

Silver powder	:	NOEC/21 d/Daphnia magna (Water flea): 0.00327 mg/l Information given is based on data obtained from similar substances.
2-(2-Ethoxyethoxy)ethyl acetate	:	NOEC/21 d/Daphnia magna (Water flea): 102 mg/l

Persistence and degradability

Silver powder	:	Result: Not biodegradable
(2-Methoxymethylethoxy)propanol	:	Readily biodegradable.
2-(2-Ethoxyethoxy)ethyl acetate	:	Result: Biodegradable

Bioaccumulation

(2-Methoxymethylethoxy)propanol	:	Bioaccumulation is unlikely.
2-(2-Ethoxyethoxy)ethyl acetate	:	Bioaccumulation is unlikely.

Mobility in soil

No information available.

Other adverse effects

No information available.

Section 13 - Waste Disposal

Waste disposal methods : If recycling is not practicable, dispose of in compliance with local regulations. Never place unused product down any indoor or out door drain. Do not reuse empty container. Contaminated/not cleaned containers should be treated/handled like product waste. Dispose of container properly. Refer to applicable Local, State/Provincial, and Federal Regulations, as well as industry Standards.

Contaminated packaging : Dispose of in accordance with local regulations.

Section 14 - Transport Information

China Dangerous Goods Regulation

UN number	:	3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Silver)
Class	:	9
Packing group	:	III

IMDG

UN number	:	3082
UN proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Silver)
Transport hazard class	:	9
Packing group	:	III

Marine pollutant : yes

IATA

UN number : 3082
UN proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Silver)
Transport hazard class : 9
Packing group : III

Matters needing attention for transportation : Not applicable

Section 15 - Regulatory Information

Regulation on the Safety Management of Hazardous Chemicals
Production Safety Law of the People's Republic of China
Law of the People's Republic of China on Prevention and Treatment of Occupational Disease
Environmental Protection Law of the People's Republic of China
Law of the People's Republic of China on the Prevention and Control of Atmospheric Pollution
Marine Environment Protection Law of the People's Republic of China
Fire Protection Law of the People's Republic of China
Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Wastes
Occupational exposure limits for hazardous agents in the workplace Part 1 Chemical hazardous agents (GBZ2.1)
Occupational exposure limits for hazardous agents in the workplace Part 2 Physical agents (GBZ2.2)
General rule for classification and hazard communication of chemicals (GB13690)
Lists of Dangerous Goods (GB12268)
Dangerous goods classification (GB6944)
Common dangerous chemical storage rules (GB15603)
Packaging Symbols of Dangerous Goods (GB190)
National Hazardous Waste Inventory

Section 16 - Other Information

References

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Significant change from previous version is denoted with a double bar.

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