Section 1: Product and Company Identification

Product Name
Acetic anhydride

Manufacturer or supplier's details
Celanese (Shanghai) International Trading Co., Ltd.
Room 239, Xinmao Building
South Taizhong Road
Waigaoqiao Free Trade Zone
Shanghai, China

Celanese Pte Ltd
60 Anson Road
Maple Tree Anson #13-02
Singapore 079914

Product Information
HazCom@celanese.com

Emergency telephone
Emergency telephone +86-532-83889090 (NRCC)

Identified uses
Chemical intermediate

Section 2: Hazard Identification

Emergency Overview
Flammable liquid and vapor. Harmful if swallowed. Causes skin, eye, digestive tract and respiratory tract burns. Harmful if inhaled

GHS Classification
<table>
<thead>
<tr>
<th>Hazards</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammable liquid</td>
<td>Category 3</td>
</tr>
<tr>
<td>Acute oral toxicity</td>
<td>Category 4</td>
</tr>
<tr>
<td>Acute inhalation toxicity</td>
<td>Category 2</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>Category 1B</td>
</tr>
</tbody>
</table>
### SAFETY DATA SHEET (GB/T 16483 and GB/T17519)

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Acetic anhydride</th>
<th>MSDS number</th>
<th>80005</th>
<th>Revision Number</th>
<th>10.03</th>
<th>APCN/EN</th>
<th>Revision Date</th>
<th>May.18.2018</th>
<th>Issuing date</th>
<th>Feb.12.2019</th>
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</thead>
</table>

#### Symbol(s)

- Flammable liquid and vapor
- Harmful if swallowed
- Causes severe skin burns and eye damage
- Fatal if inhaled

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#### Labeling

**Signal Word**
Danger

**Hazard Statements**
- H226 - Flammable liquid and vapor
- H302 - Harmful if swallowed
- H314 - Causes severe skin burns and eye damage
- H330 - Fatal if inhaled

**Prevention**
- P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking
- P233 - Keep container tightly closed
- P240 - Ground/Bond container and receiving equipment
- P241 - Use explosion-proof electrical/ventilating/lighting/equipment
- P242 - Use only non-sparking tools
- P243 - Take precautionary measures against static discharge
- P280 - Wear protective gloves/protective clothing/eye protection/face protection
- P264 - Wash hands thoroughly after handling
- P270 - Do not eat, drink or smoke when using this product
- P260 - Do not breathe dust/fume/gas/mist/spray/spray.
- P271 - Use only outdoors or in a well-ventilated area
- P284 - Wear respiratory protection

**Response**
- P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
- P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
- P301 + P330 + P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
- P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
- P310 - Immediately call a POISON CENTER or doctor/physician.
- P363 - Wash contaminated clothing before reuse

**Storage**
- P403 + P233 - Store in a well-ventilated place. Keep container tightly closed
- P405 - Store locked up

**Disposal**
- P501 - Dispose of contents/container in accordance with local regulations.

**Physical and chemical hazards**
Flammable liquid and vapor. May react violently with water.
Potential health effects

Routes of exposure
Skin, eyes, inhalation, ingestion.

Immediate effects

**Skin**
Causes skin burns. Symptoms of overexposure include: Redness or discoloration, swelling, itching, burning or blistering of skin.

**Eyes**
Exposure to liquid Causes severe eye burns, damage irreversible. Exposure to vapors Causes eye irritation. Symptoms of exposure may include: Eye irritation, burning sensation, pain, watering, and/or change of vision.

**Inhalation**
Causes respiratory tract irritation. Harmful if inhaled. Symptoms of exposure may include: Nasal discharge, hoarseness, coughing, chest pain and breathing difficulty. Accumulation of fluid in the lungs (pulmonary edema); symptoms can be delayed for several hours.

**Ingestion**
Causes digestive tract burns. May be harmful if swallowed. Symptoms of exposure may include: Inflammation of mouth, throat, esophagus and/or stomach. Nausea, vomiting, loss of appetite, gastrointestinal irritation and/or diarrhea.

Delayed / long-term effects
No information available

Environmental hazards
No data available

Section 3: Composition/information on ingredients

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetic anhydride</td>
<td>108-24-7</td>
<td>min 99.5</td>
</tr>
</tbody>
</table>

Section 4: First Aid Measures

**General Information**
Remove contaminated, soaked clothing immediately and dispose of safely. Pay attention to own protection. In any case show the physician the Safety Data Sheet.

**Inhalation**
Keep at rest. Move to fresh air. Call a physician immediately.

**Skin**
Wash off immediately with plenty of water for at least 15 minutes
Obtain medical attention

**Eyes**
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician immediately.

**Ingestion**
Rinse with plenty of water. If conscious, drink plenty of water. If swallowed, do not induce vomiting - seek medical advice.

**Main symptoms**
Vapours may cause irritation to the eyes, respiratory system and the skin.

**Special hazard**
respiratory disorder.
Treatment
Treat symptomatically. In case of lung irritation first treatment with dexametason aerosol (spray). In case of choking: gastroscopy inclusive of aspiration and acidosis compensation.

Section 5: Fire-fighting Measures

Suitable extinguishing media
Foam, Dry powder, Carbon dioxide (CO2)

Extinguishing media which must not be used for safety reasons
Do not use a solid water stream as it may scatter and spread fire.

Special exposure hazards arising from the substance or preparation itself, its combustion products, or released gases
Under conditions giving incomplete combustion, hazardous gases produced may consist of Carbon monoxide Carbon dioxide (CO2)
Combustion gases of organic materials must in principle be graded as inhalation poisons

Special protective equipment for fire-fighters
self-contained breathing apparatus (EN 133).

Environmental precautions
Water run-off and vapor cloud may be corrosive.. Dike and collect water used to fight fire..

Other Information
In the event of fire, cool tanks with water spray.. Reacts violently with water.

Section 6: Accidental Release Measures

Personal precautions
Avoid contact with the skin and the eyes. Keep away from heat and sources of ignition. Provide adequate ventilation.

Environmental precautions
Prevent further leakage or spillage. Do not discharge into the drains/surface waters/groundwater.

Methods for cleaning up
Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust)
Keep in suitable, closed containers for disposal
Dispose of in accordance with local regulations

Additional information
Consult trained personnel Consider the information for "Personal Protection" in chapter 8 of this Safety Data Sheet

Section 7: Handling and storage

Advice on safe handling
Handle product only in closed system or provide appropriate exhaust ventilation at machinery
Store in a place accessible by authorized persons only
Personal precautions
Avoid contact with the skin and the eyes
Keep away from heat and sources of ignition
Provide adequate ventilation

Protection - fire and explosion:
Keep away from sources of ignition - No smoking. Take necessary action to avoid static electricity discharge. In case of fire, emergency cooling with water spray should be available.

Temperature class
T2

Material storage
Store locked up. Keep in a dry, cool and well-ventilated place.

Technical measures/Storage conditions
Keep containers tightly closed in a dry, cool and well-ventilated place. Take measures to prevent the build up of electrostatic charge.

Incompatible products
Keep away from: Bases, Amines, water

German storage class
3A: Flammable liquids.

Section 8: Exposure controls/personal protection

ACGIH Exposure Limits

<table>
<thead>
<tr>
<th>Components</th>
<th>TWA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetic anhydride</td>
<td>5 PPM</td>
</tr>
</tbody>
</table>

China National Exposure Limits

<table>
<thead>
<tr>
<th>Components</th>
<th>TWA:</th>
<th>STEL:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetic anhydride</td>
<td>16 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

Exposure controls

Engineering measures
General or dilution ventilation is frequently insufficient as the sole means of controlling employee exposure. Local ventilation is usually preferred.

Personal protective equipment

General advice
Use only in an area equipped with a safety shower. Avoid contact with skin and eyes. Do not breathe vapors or spray mist.
Hygiene measures
When using, do not eat, drink or smoke. Take off all contaminated clothing immediately. Wash hands before breaks and immediately after handling the product.

Respiratory protection
If aerosols or vapors are present, respiratory protection is required (gas filter E).

Eye protection
Tightly fitting safety goggles.

Skin protection
Impervious clothing

Hand protection
Chemicals resistant gloves
Suitable material
Butyl-rubber
Type
Butoject (Company KCL) or comparable article; or refer to glove manufacturer's recommendation
Evaluation
according to EN 374: level 6
Material thickness
Approx. 0.3 mm
Break through time
approx. 480 min

Section 9: Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>liquid</td>
</tr>
<tr>
<td>Color</td>
<td>colourless</td>
</tr>
<tr>
<td>Odor</td>
<td>pungent, of vinegar</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>0.13 ppm (gas in air)</td>
</tr>
<tr>
<td>Flash point</td>
<td>49°C</td>
</tr>
<tr>
<td>Method</td>
<td>closed cup</td>
</tr>
<tr>
<td>Ignition temperature</td>
<td>330°C</td>
</tr>
<tr>
<td>Method</td>
<td>DIN 51794</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>~2.0 Vol. %</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>~10.2 Vol. %</td>
</tr>
<tr>
<td>Melting point/range</td>
<td>-73°C</td>
</tr>
<tr>
<td>Boiling point/range</td>
<td>140°C @ 1013 hPa</td>
</tr>
<tr>
<td>Density</td>
<td>1.08 g/ml @ 20°C</td>
</tr>
<tr>
<td>Viscosity</td>
<td>0.843 mPa*s @ 25°C</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>5 hPa @ 20°C</td>
</tr>
<tr>
<td></td>
<td>29 hPa @ 50°C</td>
</tr>
<tr>
<td>Vapor density</td>
<td>3.5 (Air=1)</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>0.46 (n-Butyl acetate = 1)</td>
</tr>
<tr>
<td>Water solubility</td>
<td>hydrolyses</td>
</tr>
<tr>
<td>Partition coefficient (n-octanol/water)</td>
<td>-0.58 (calculated)</td>
</tr>
</tbody>
</table>

Section 10: Stability and reactivity

Reactivity
May react with evolution of heat and/or toxic gases on contact with water.

Possibility of hazardous reactions
Reacts violently with water, alkalis, alcohols, amines.

Conditions to avoid
Keep away from heat, sparks and flame. Avoid any source of ignition.
Incompatible Materials
Keep away from: water, steam, Alcohols, Aqueous solution of alkali salts, Acids, Peroxides, Amines, Strong oxidizing agents.

Section 11: Toxicological information

Acetic anhydride

Acute oral toxicity
Species: rat
Method: Standard Acute Method
LD50: 630 mg/kg

Acute inhalation toxicity
Species: rat
Method: Similar to OECD 412
LC100 (6h): 400 ppm

Skin corrosion/irritation
Species: Humans
corrosive

Serious eye damage/eye irritation
Species: rat
OECD 413

Skin Sensitization
in vitro Mutagenicity
nonsensitizer
Ames Test: negative - with and without metabolic activation - Method: OECD 471
In vitro Mammalian Chromosome aberrations in Chinese Hamster Cells: negative - with and without metabolic activation - Method: OECD 473

in vivo Mutagenicity
Did not cause chromosomal damage in rat bone marrow
Method: EU B.12

Carcinogenic effects
No evidence of carcinogenicity

Developmental effects
no adverse developmental effects

Routes of exposure
Species: rat
Method: OECD 414
Type of study: Prenatal Developmental Toxicity Study

Repeated exposure
No adverse effects

Routes of exposure
Species: rat
Method: OECD 412
Type of study: 28-day repeated administration toxicity test

Section 12: Ecological information

Acetic anhydride

Acute fish toxicity
Species: Oncorhynchus mykiss (rainbow trout)
Method: SOP E257
LC50: > 300.82 mg/l (96h)
(Reference substance: Potassium acetate solution)
Section 12: Ecological information

Acute daphnia toxicity
Species: Daphnia magna
Method: OECD 202
Toxicity to aquatic plants
Species: Skeletonema costatum
Method: ISO 10253
Toxicity to bacteria
Species: Pseudomonas putida
Biodegradation
Method: Readily biodegradable
Other potential hazards
The substance does not meet the criteria for PBT / vPvB according to REACH, Annex XIII

Section 13. Disposal considerations

Product information
Disposal required in compliance with all waste management related state and local regulations. The choice of the appropriate method of disposal depends on the product composition by the time of disposal as well as the local statutes and possibilities for disposal.

Uncleaned empty packaging
Contaminated packaging should be emptied as far as possible and after appropriate cleansing may be taken for reuse.

Section 14: Transport information

ADR/RID
UN/ID No. UN 1715
Proper Shipping Name Acetic anhydride
Hazard Class 8
Subsidiary Risk 3
Packing group II
Tunnel Restriction Code (D/E)
Hazard Number 83

ADN
UN/ID No. UN 1715
Proper Shipping Name Acetic anhydride

ICAO/IATA
UN-No. UN 1715
Proper Shipping Name Acetic anhydride
Section 14: Transport information

| Hazard Class | 8 |
| Subsidiary Risk | 3 |
| Packing group | II |

IMDG

| UN/ID No. | UN 1715 |
| Proper Shipping Name | Acetic anhydride |
| Hazard Class | 8 |
| Subsidiary Risk | 3 |
| Packing group | II |
| Marine pollutant | no |
| EmS Code | F-E, S-C |

Section 15. Regulatory information

The following laws, regulations, rules and standards provide appropriate provisions of the management of the chemical:

**Occupational Disease Prevention Law:**
Catalog of classification of occupational hazards: listed - alcohols synthesis, lipid synthesis, anhydride synthesis, other organic synthetic materials
Occupational disease catalog: 4. Physical factor

**Regulations on Safe Management of Hazardous Chemicals:**
Catalogue of Hazardous Chemicals: listed
GB 18218-2009 "major hazard identification of hazardous chemicals ": acetic anhydride: 23 °C <= flashpoint <61 °C ,critical volume (t): 5000
List of first batch of hazardous chemicals under priority management: unlisted

**Labor protection regulations for use of toxic substances in workplaces:**
Catalog of highly toxic goods: Not Listed

**Provisions on the First Import of Chemicals and the Import and Export of Toxic Chemicals:**
List of Toxic Chemicals Restricted to be Imported/Exported: Not listed

**List of Dangerous Goods (GB12268-2012):**
List of Dangerous Goods (GB12268-2012): Listed. Hazard class 8, Corrosive; Subsidiary Risk 3, flammable liquid

**International Inventories**
Listed on the chemical inventories of the following countries or qualifies for an exemption:
- Australia (AICS)
- Canada (DSL)
- China (IECSC)
- Europe (EINECS)
- Japan (ENCS)
- Japan (ISHL)
- Korea (KECI)
- New Zealand (NZIoC)
- Philippines (PICCS)
- United States (TSCA)
Remarks
Downstream users shall comply with local regulations concerning the chemicals

Section 16: Other information

Changes against the previous version are marked by ***

Sources of key data used to compile the datasheet
Information contained in this safety data sheet is based on Celanese owned data and public sources deemed valid or acceptable. The absence of data elements required by ANSI or 1907/2006/EC indicates that no data meeting these requirements is available.

Further information
This information is based on our present state of knowledge. It shall describe our products regarding safety requirements and shall not be construed as a guarantee or statement of condition and/or quality. For more information, other material safety data sheets or technical data sheets please consult the Celanese homepage (www.celanese.com).

Abbreviation and Acronym:
ADR = Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
CAS = Chemical Abstracts Service (division of the American Chemical Society)
CLP = Classification, Labelling and Packaging
DNEL = Derived No Effect Level
EINECS = European Inventory of Existing Commercial Chemical Substances
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
ICAO = International Civil Aviation Organization
IMDG = International Maritime Code for Dangerous Goods
LC50 = Lethal Concentration
LD50 = Lethal Dose
LOAEC = Low Observed Adverse Effect Concentration
LOAEL = Low Observed Adverse Effect Level
LOEL = Low Observed Effect Level
NOAEC = No Observed Adverse Effect Concentration
NOAEL = No Observed Adverse Effect Level
NOEC = No Observed Effect Concentration
NOEL = No Observed Effect Level
PBT = Persistent, Bioaccumulative and Toxic
PNEC = Predicted No Effect Concentration
RCR = Risk Characterization Ratio
RID = Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
STP = Sewage Treatment Plant
vPvB = very Persistent and very Bioaccumulative