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Material Safety Data Sheet

2023.01

1. Identification

Product Name: Phthalic Anhydride
Other Names: —
Recommended use and restrictions on use: Manufacture of alkyd resins, plasticizers, resin hardeners,unsaturated polyester resins,phenolphthalein and other phthaleins,dyes,chlorides,pharmaceutical intermediates, pesticide,diethyl phthalate, dimethyl phthalate, laboratory reagents.
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2. Hazard(s) identification

Product hazard classification : Acute toxicity category 4(oral) ; Skin corrosion/irritation category 1,corrosive including subcategories A, B and C ; Skin corrosion/irritation category 2, Irritant ; Serious eye damage/eye irritation category 1, irreversible effects ; Respiratory sensitizer category 1 ; Skin sensitizer category 1
Labelling elements: 

Signal word : DANGER

Hazard statements :

Class III toxic chemical substance : when exposed will immediately endanger human or other lives.

Harmful if swallowed (oral) ;

Causes severe skin burns and eye damage ;

Causes skin irritation ;

Causes serious eye damage ;

May cause allergic or asthmatic symptoms or breathing difficulties if inhaled ;

May cause allergic skin reaction

Precautionary statements :

Avoid inhalation of gas, vapor, smoke, mist ;

If the material contact with eyes, immediately flush affected eyes with plenty of water and get medical attention ;

Avoid the material contact with skin and eyes.

Other hazards: —

3. Composition/information on ingredients

Substance:

Common name: Phthalic Anhydride

Synonyms: 1,2-Benzenedicarboxylic Acid Anhydride ; 1,3-Isobenzofurandione ; Phthalic Acid Anhydride

Chemical Abstract Service (CAS) Registry Number: 85-44-9

The hazardous ingredient (% of the content): Phthalic Anhydride 99.5 % W/W

4. First-aid measures

The first-aid instructions by relevant routes of exposure:

Inhalation:

1. Remove the patient to fresh air.
2. If patient is not breathing, give artificial respiration.
3. Keep patient warm and calm then get medical attention immediately.

Skin contact:

1. Remove contaminated clothing and shoes.
2. Flush affected areas with plenty of water and soap (or neutral purger).
3. If irritation develops, get medical attention immediately.

Eye contact:

1. Hold eyelids apart and flush affected eyes with plenty of water immediately.
2. If irritation develops, get medical attention immediately..

Ingestion:

1. If patient is conscious and can swallow, immediately rinse mouth and drink plenty of water. Stimulate the pharynx to induce vomiting by finger.
2. If patient is unconscious, do not give anything by mouth and do not induce vomiting.
3. Get medical attention immediately.

The most important symptoms and hazardous effects:

Material contact may cause skin burns. Inhalation of dust or vapor may cause cough or nosebleeds.

The protection of first-aider:

The first-aid personnel should wear full chemical protective clothing and breathing apparatus to remove the patients. And give first aid in safe area with C-class garment.

Notes to physicians:

Avoid gastric lavage or inducing vomiting.

5. Fire-fighting measures

Suitable extinguishing media:

carbon dioxide, dry chemical powder, foam, water spray, alcohol foam

Use water spray to put out the fire or lower the temperature only when under safe conditions. Collect the spills and waste water to dispose. Avoid polluting the environment.

Specific hazards arising during fire-fighting:

1. May generate hazardous gases.
2. When react with water or erode iron and soft steel will generate flammable hydrogen.
3. The dust cloud might be ignited by spark and cause an explosion under some conditions

Specific fire-fighting methods:

1. If it fails to stop the spills before fire-fighting, let fire burn out when making sure no danger around. If the spill continues during fire-fighting, the vapor will mix with air to form explosive mixtures and ignite.
2. Separate non-combustion materials and protect personnel.
3. Remove the containers to safe area if possible.
4. Keep containers cool by spraying with water if exposed to fire.
5. The fire fighters should have been given fire-fighting training for all kinds of flammable liquids.
6. If the spill does not ignite, spray water to disperse vapor and to protect personnel who try to stop

the spills.

7. Using water jet is no avail.
8. Use unmanned water spray control cabinet or automatic oscillating fire water monitor at large-scale fire.
9. Evacuate from the scene of a fire and let the fire burn out.
10. Keep away from the tank.
11. Withdraw immediately when safety valve of tank ring or discolor resulted from fire.
12. Evacuate area of personnel who do not wear protective equipments.
13. Avoid water enter into the containers.
14. Use water spray to put out a fire at KCN storage area.
15. Remove the KCN containers to safe area if possible.

Special protective equipment for firefighters:

Wear full chemical protective clothing and breathing apparatus. Sometimes a flash-resistant aluminum coat is necessary.

6. Accidental release measures

Personal precautions:

1. Evacuate the spilt area of personnel who do not wear protective equipments and clothing until clearing up the spills.

Environmental precautions:

1. Removal of ignition sources.
2. Provision of sufficient ventilation to disperse the spills.

Methods and materials for cleaning up:

1. Collect all spills and contaminated materials for disposal. Prevent contamination entry into environment.
2. Sweep the powder release to be on papers or other proper materials and place in suitable containers. Then destroy the containers by burning in chemical fume hoods.
3. Try to recovery all released materials when large amounts released. If could not recovery, collect the released materials as waste disposal. Use vermiculite, dry sand, soil or similar substances to absorb the liquid released material.
4. Pollution control measures : Avoid hazardous chemicals discharge into the environment according to standard emergency procedures. The waste water and materials should be collected and handled in accordance with related regulations for industrial waste storage, clearance, and disposal.

7. Handling and storage

Handling:

1. Keep containers tightly closed. Avoid contact with moisture.
2. Make sure that the procedure is executed by properly trained personnel
3. Comply with regulations for fire prevention and explosion-proof.
4. Emergency measures:
 - (1) Start the warning system. Evacuate the personnel to windward and inform the industrial safety and environment protection personnel and operators.

<p>(2) Remove the heat source, ignition source and separate the spilt area. Cool the exterior of tank by spraying water</p> <p>(3) Wear protective equipment to relieve the victims of a disaster and give first-aid to patients.</p> <p>5. The warning system : to broadcast and sound the alarm to inform all personnel in factory.</p>
<p>Storage:</p> <p>1. Store in a cool, dry and well-ventilated area.</p> <p>2. Keep away from heat source, ignition source and incompatible substances (like strong oxidant).</p> <p>3. Keep the containers tightly closed and avoid contact with moisture.</p>

8. Exposure controls/personal protection

<p>Engineering control:</p> <p>1. Provide local exhaust system or whole ventilation system.</p>			
<p>Control parameters:</p>			
<p>8 hours time weighted average exposure TWA</p>	<p>limits/Short-term exposure STEL</p>	<p>limits/maximum exposure CEILING</p>	<p>Limits biological standards: BEIs</p>
<p>1 ppm</p>	<p>2 ppm</p>	<p>—</p>	<p>—</p>
<p>Personal protective equipment:</p> <p>Respiratory protection:</p> <p>1. <math> < 30\text{mg}/\text{m}^3 </math> : Dust and mist respirator.</p> <p>2. <math> < 60\text{mg}/\text{m}^3 </math> :</p> <p>(1) Dust or mist respirator except disposable and quarter-face type.</p> <p>(2) Full-face respirator with a high efficiency dust filter.</p> <p>(3) Power-respirator with a dust or mist filter.</p> <p>(4) Air-supplied respirator.</p> <p>(5) Full-face self-contained respirator.</p> <p>Hand protection:</p> <p>Impervious gloves. The better material is 4H.</p> <p>Eye protection:</p> <p>1. Full-face shield.</p> <p>2. Dust/splash goggles.</p> <p>3. Do not wear contact lenses.</p> <p>Skin and body protection:</p> <p>Impervious protective clothing.</p>			

<p>Hygiene measures:</p> <ol style="list-style-type: none"> 1. Remove contaminated clothing immediately after work. Launder clothing soaked or soiled with this material before reuse or discard. Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing. 2. No smoking, eating or drinking at working place. 3. Wash hands thoroughly after handling this material. 4. Keep working place clean.
<p>Hygiene measures:</p> <ol style="list-style-type: none"> 1. Remove contaminated clothing immediately after work. Launder clothing soaked or soiled with this material before reuse or discard. Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing. 2. No smoking, eating or drinking at working place. 3. Wash hands thoroughly after handling this material. 4. Keep working place clean.

9. Physical and chemical properties:

Appearance (physical state, color, etc) : White crystal, flake, powder solid	Odor: Characteristic acrid, choking
Odor threshold: 0.053ppm	Melting point: 131°C
pH value: React with water and form acid solution	Boiling point / boiling point range: 284.5°C (sublimation)
Flammability (solid, gas): —	Flash point: 152 °C
Decomposition temperature: —	Test method: —
Auto-ignition temperature: 570 °C	Explosion limits: 1.7 %~10.5 %
Vapor pressure: 0.0002 mmHg@20°C	Vapor density: 5.1
Density: 1.527@4°C	Solubility: 0.6 g/100ml water (Very slightly soluble in water)
Partition coefficient (n-octanol/water,log Kow): -0.62~1.63	Evaporation rate: —

10. Stability and reactivity

<p>Stability: Stable under ordinary conditions of use and storage.</p> <p>Possible hazardous reactions under specific conditions:</p> <ol style="list-style-type: none"> 1. Strong oxidant : this material contact with strong oxidant may cause fires and explosions. 2. Water : this material may react with water slowly. 3. Liquid material may erode some kinds of plastics, rubbers and coating film.
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<p>4. Strong alkali : this material may react violently with strong alkali and splash. And cause rising temperature and pressure.</p> <p>5. Strong reductant : this material may react violently with strong reductant.</p> <p>6. Nitric acid and sulfuric acid : mix fuming nitric acid with phthalic anhydride dissolved in sulfuric acid at 80-100°C may generate explosive materials.</p>
<p>Conditions to avoid: Heat, spark, ignition sources, generation of dust and mist.</p>
<p>Materials to avoid: Strong oxidant, water, plastics, rubbers and coating film.</p>
<p>Hazardous decomposition products: Smoke of phthalic anhydride, carbon monoxide, carbon dioxide</p>

11. Toxicological information

<p>Routes of exposure: inhalation, eye contact, skin contact, ingestion.</p>
<p>Symptoms: irritation, burn, cough, sneeze, nosebleed.</p>
<p>Acute toxicity:</p> <ol style="list-style-type: none"> 1. May cause irritation of eyes, nose, throat and skin. If contact with wet surface may cause more severe irritation. 2. If contact with skin and covered by clothing and shoes, may cause skin burns. 3. If inhale vapor or dust, may cause cough, sneeze, or nosebleed. <p>LD50(rat, oral) : 4,020 mg/kg</p> <p>LC50(rabbit, dermal) : 500 mg/24H cause slight irritation.</p>
<p>Chronic toxicity or long-term toxicity:</p> <ol style="list-style-type: none"> 1. May cause skin rash and long-term eye irritation. 2. May cause skin allergy. 3. May cause bronchitis, asthma, tachypnoea and chest distress. Symptom of asthma or allergy would cause harm to patients likely. <p>1 mg/m³ (male rat forty-five days before copulation, inhalation) may affect procreationsystem of next-generation male.</p>

12. Ecological information:

<p>Ecotoxicity:</p> <p>LC50(fish) : —</p>

EC50(invertebrate) : —

Bioconcentration factor (BCF) : 5-4053

Persistence and degradability:

1. Five-days biological oxygen demand(BOD):106 % °
2. When released into water, this material is expected to hydrolyze or probably direct photolyze.
3. When released into the air, this material is expected to photolyze directly or to react with hydroxyl radicals.

half-life time(air) : 485~4847 hrs

half-life time(water surface) : 0.0089~0.45 hrs

half-life time(groundwater) : 0.0089~0.45 hrs

half-life time(soil) : 0.0089~0.45 hrs

Bioaccumulative potential: —

Mobility in soil:

When released into the soil, this material is expected to hydrolyze in wet soil.

Other adverse effects: —

13. Disposal considerations

Methods of waste disposal:

Waste must be disposed in accordance with state and local environmental control regulations :

comply with relevant laws and regulations for industrial waste disposal.

1. Use sanitary landfill method to handle the waste which could not be incinerated.
2. Use incineration method in suitable incinerator with an exhaust and purifying equipment.
3. Make the waste dissolve in inflammable solvent (like alcohol) first and spurt into suitable incinerator with an exhaust and purifying equipment.
4. Use vermiculite, dry sand, soil or similar substances to absorb the liquid waste, then use certificated sanitary landfill method to handle the waste.

14. Transport information

United Nations number (UN No): 2214

UN Proper shipping name: Phthalic anhydride (maleic anhydride content: >0.05%)

Transport hazard class: 8 CORROSIVE
Packing group: III
Marine pollutant (Yes/No): No
Specific transport measures and precautionary conditions: In accordance with Toxic Chemical Substances Transportation Management Regulations.

15. Regulatory information

<p>Applicable regulations:</p> <ol style="list-style-type: none"> 1. Regulations for Labor Safety and Health Installations. 2. Regulation of Labelling and Hazard Communication of Dangerous and Harmful Materials. 3. Ordinance on Prevention of Organic Solvent Poisoning. 4. Standards for Allowable Concentration of Hazardous Substances in the Air in Labor Operations Environments. 5. Traffic Regulation. 6. Method and Facility Standards for Industrial Waste Storage, Clearance, and Disposal. 7. Toxic Chemical Substances Control Act.
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16. Other information

Literature references	<ol style="list-style-type: none"> 1. CHEMINFO database, CCINFO CD-ROM, 99-2 2. New Jersey Hazardous Substance Fact Sheets database, TOMES PLUS CD-ROM, Vol.41, 1999 3. RTECS database, TOMES PLUS CD-ROM, Vol. 41, 1999 4. HSDB database, TOMES PLUS CD-ROM, Vol. 41, 1999 5. NIOSH/OSHA, Occupational Health Guidelines for Chemical Hazards, 1981
Note	In the above-mentioned information, symbol "—" means data not available at present, and " / " means this item is not applicable for this product.

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