Material Safety Data Sheet

City University of Hong Kong

MSDS    Phthalic anhydride    0461

PRODUCT INFORMATION

Chemical name: Phthalic anhydride
Chinese Name: 酐
Synonyms: 1,2-Benzenedicarboxylic acid anhydride; 1,3-isobenzofurandione; 1,3-phthalandione; phthalic acid anhydride.
Chemical family: Acid anhydride
Formula: C6H4(CO)2O
Molecular weight: 148
CAS number: 85-44-9

RISK SYMBOL

PHYSICAL DATA

Boiling point (760 mm Hg): 285°C (545 °F)
Freezing point: 131 °C (268 °F)
Specific gravity (H₂O = 1 @ 20/20°C): Flake- 1.53  Molten - 1.2
Vapor pressure (20°C):  0.0015 mm Hg (131°C):  6 mm Hg
Vapor density (Air = 1 @ 20°C): 5.1
Solubility in water (% by WT @ 20°C): 0.6
Percent volatiles by volume: 100
Appearance and odor:
Phthalic anhydride flake is a white solid. Molten phthalic anhydride is a clear, colorless mobile liquid. Both have a choking odor.

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FIRE AND EXPLOSION DATA
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Flammable limits in air, % by volume
Upper:  10.4
Lower:  1.7
Flash point (test method):
Tag open cup (ASTM D1310):  329°F (165°C)
Tag closed cup (ASTM D56):  305°F (152°C)
Extinguishing media:
Use CO₂ or dry chemical for small fires, alcohol-type aqueous film-forming foam or water spray for large fires.

Special fire-fighting procedures:
If potential for exposure to vapors or products of combustion exists, wear complete personal protective equipment and respirator approved by both NIOSH and MSHA and within the working limits of the respirator. Self-contained breathing apparatus with full facepiece operated in pressure demand or other positive pressure mode. Supplied-air respirator with full facepiece and operated in pressure-demand or other positive pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive pressure mode. Use water spray to cool fire-exposed structures and vessels.

Unusual fire and explosion hazards:
During fire-fighting operations, avoid directing water into vessels containing anhydrides. Flake - can form an explosive organic dust cloud. Do not use compressed air to transfer this material. Foam or water can cause frothing.

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REACTIVITY DATA
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Stability: Stable
Hazardous polymerization: Will not occur.
Conditions to avoid: Heat, spark, flame.
Materials to avoid: Nitric acid, hydrogen peroxide and other strong oxidizing agents.
Hazardous combustion or decomposition products: Carbon monoxide.

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HEALTH HAZARD DATA
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Acute:
Ingestion (swallowing): Slightly toxic to animals (oral LD₅₀, rats: 4.0  g/kg).

The above information is believed to be accurate to the best of our knowledge. No responsibilities or liabilities are assumed or implied by CITY U for their inaccuracies.
Inhalation (breathing):
Irritating to mouth, throat and nasal passages. No information regarding toxicity to animals by inhalation.

Skin contact:
Can cause severe injury (reddening and swelling). Causes sensitization (allergic reaction). No information regarding toxicity to animals by absorption.

Eye contact: Can cause severe injury - damage reversible.

Chronic:
Carcinogenicity: No information.
Reproduction: No information.
Medical conditions aggravated by exposure:
Significant exposure to this chemical may adversely affect people with chronic disease of the respiratory system, skin, eyes, liver and/or kidneys.

FIRST AID MEASURES

Ingestion (swallowing):
Induce vomiting of conscious patient immediately by giving two glasses of water and pressing finger down throat. Contact a physician immediately.

Inhalation (breathing):
Remove patient from contaminated area. If breathing has stopped, give artificial respiration, then oxygen if needed. Contact a physician immediately.

Skin contact:
Remove contaminated clothing and wash contaminated skin with large amounts of water. If irritation persists, contact a physician.

Eye contact:
Flush eyes with water for at least 15 minutes. Contact a physician immediately.

PREVENTATIVE MEASURES

Respiratory protection:
Based on contamination level and working limits of the respirator, use a respirator approved by both NIOSH and MSHA.

5 ppm - Any dust and mist respirator except single-use respirators.

10 ppm - Any dust and mist respirator except single-use and quarter-mask respirators. Any supplied-air respirator. Any self-contained breathing apparatus.
25 ppm - Any supplied-air respirator operated in a continuous flow mode. Any powered air-purifying respirator with a dust and mist filter.

50 ppm - Any supplied-air respirator with a full facepiece. Any self-contained breathing apparatus with a full facepiece. Any air-purifying full facepiece respirator with a high-efficiency particulate filter.

2000 ppm - Any supplied-air respirator with a full facepiece and operated in a pressure-demand or other positive pressure mode.

Escape - Any air-purifying full facepiece respirator with a high-efficiency particulate filter. Any appropriate escape-type self-contained breathing apparatus.

Ventilation
Local exhaust: Recommended when appropriate to control employee exposure. Mechanical (general): Not recommended as the sole means of controlling employee exposure.

Protective gloves: Neoprene or rubber.
Eye protection: Chemical safety goggles.
Other protective equipment: For operations where spills can occur, use impervious body covering and boots.

Precautions to be taken in handling and storing:
Keep away from heat, sparks and flame. Keep containers closed. When transferring follow proper grounding procedures. Use with adequate ventilation. Avoid breathing vapor. Avoid contact with eyes, skin and clothing. Wash thoroughly with soap and water after handling. Wash contaminated clothing thoroughly before re-use. Discard contaminated leather clothing. Do not enter storage area unless adequately ventilated. Avoid generation of excessive dust.

ENVIRONMENTAL PROTECTION DATA

Steps to be taken if material is released or spilled:
Eliminate ignition sources. Avoid eye or skin contact. Place leaking containers in well-ventilated area. Contain spill to minimize contaminated area and facilitate salvage or disposal. Avoid runoff into storm sewers and ditches which lead to natural waterways. All clean-up and disposal should be carried out in accordance with federal, provincial and local regulations. If required, provincial and local authorities should be notified.