Section 1 - Product and Company Information

Product Name                  PHTHALIC ANHYDRIDE, ACS
Product Number                80018
Brand                        FLUKA
Company                      Sigma-Aldrich Canada, Ltd
Address                      2149 Winston Park Drive
                              Oakville ON L6H 6J8 CA
Technical Phone:             9058299500
Fax:                         9058299292
Emergency Phone:             800-424-9300

Section 2 - Composition/Information on Ingredient

Substance Name                          CAS #                 SARA 313
PHTHALIC ANHYDRIDE                      85-44-9               Yes

Formula         C8H4O3

Synonyms        Anhydride phthalique (French) * Anhydrid kyseliny ftalove (Czech) * Anidrida ftalica (Italian) * 1,2-Benzenedicarboxylic acid anhydride * 1,3-Dioxophthalan * ESEN * Ftaalzuuranhydride (Dutch) * Ftalanhydrid (Czech) * Ftalowy bezwodnik (Polish) * Isobenzofuran, 1,3-dihydro-1,3-dioxo- * 1,3-Isobenzofurandione * NCI-C03601 * Phthalandione * 1,3-Phthalandione * Phthalic acid anhydride * Phthalic anhydride (ACGIH:OSHA) * Phthalsaeureanhydrid (German) * RCRA waste number U190 * Retarder AK * Retarder PD * Vulkalent B

RTECS Number:   TI3150000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW
Harmful.
Harmful if swallowed. Irritating to respiratory system and skin.
Risk of serious damage to eyes. May cause sensitization by inhalation and skin contact.
Target organ(s): Liver. Kidneys.

HMIS RATING
HEALTH: 3 *
FLAMMABILITY: 1
REACTIVITY: 0

NFPA RATING
HEALTH: 3
FLAMMABILITY: 1
REACTIVITY: 0

*additional chronic chronic hazards present.
For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE
   If swallowed, wash out mouth with water provided person is conscious. Call a physician.

INHALATION EXPOSURE
   If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE
   In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

EYE EXPOSURE
   In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

FLASH POINT
   305.6 °F  152 °C  Method: closed cup

EXPLOSION LIMITS
   Lower: 1.7 %  Upper: 10.4 %

AUTOIGNITION TEMP
   570 °C

FLAMMABILITY
   N/A

EXTINGUISHING MEDIA
   Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING
   Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Specific Hazard(s): Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL
   Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
   Wear respirator, chemical safety goggles, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP
   Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage
HANDLING
User Exposure: Do not breathe dust. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE
Suitable: Keep tightly closed.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS
Safety shower and eye bath. Mechanical exhaust required.

PERSONAL PROTECTIVE EQUIPMENT
Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a dust mask type N95 (US) or type P1 (EN 143) respirator.
Hand: Compatible chemical-resistant gloves.
Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES
Wash thoroughly after handling.

EXPOSURE LIMITS, RTECS

<table>
<thead>
<tr>
<th>Country</th>
<th>Source</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>ACGIH</td>
<td>TWA</td>
<td>1 PPM</td>
</tr>
<tr>
<td>USA</td>
<td>MSHA Standard-air</td>
<td>TWA</td>
<td>2 PPM (12 MG/M3)</td>
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<tr>
<td>USA</td>
<td>OSHA.</td>
<td>PEL</td>
<td>8H TWA 2 PPM (12 MG/M3)</td>
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<td>New Zealand</td>
<td>OEL Remarks: check ACGIH TLV</td>
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<td></td>
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<tr>
<td>USA</td>
<td>NIOSH</td>
<td>TWA</td>
<td>1 PPM</td>
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EXPOSURE LIMITS

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<th>Source</th>
<th>Type</th>
<th>Value</th>
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<tbody>
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<td>NDS</td>
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<tr>
<td>Poland</td>
<td>NDSCh</td>
<td>2 MG/M3</td>
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<tr>
<td>Poland</td>
<td>NDSP</td>
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</table>

Section 9 - Physical/Chemical Properties

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<tr>
<th>Property</th>
<th>Value</th>
<th>At Temperature or Pressure</th>
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<tbody>
<tr>
<td>Molecular Weight</td>
<td>148.12 AMU</td>
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<tr>
<td>pH</td>
<td>2</td>
<td>20 °C Concentration: 6 g/l</td>
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<tr>
<td>BP/BP Range</td>
<td>284 °C</td>
<td>760 mmHg</td>
</tr>
<tr>
<td>MP/MP Range</td>
<td>130 °C</td>
<td></td>
</tr>
<tr>
<td>Freezing Point</td>
<td>131 °C</td>
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</tr>
<tr>
<td>Vapor Pressure</td>
<td>&lt; 0.01 mmHg</td>
<td>20 °C</td>
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<tr>
<td>Vapor Density</td>
<td>5.1 g/l</td>
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<tr>
<td>Saturated Vapor Conc.</td>
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<tr>
<td>SG/Density</td>
<td>1.53 g/cm3</td>
<td>20 °C</td>
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<tr>
<td>Bulk Density</td>
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<tr>
<td>Odor Threshold</td>
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<tr>
<td>Volatile%</td>
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<tr>
<td>VOC Content</td>
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<tr>
<td>Water Content</td>
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</table>
Section 10 - Stability and Reactivity

STABILITY
Stable: Stable.  
Conditions to Avoid: Moisture.  
Materials to Avoid: Strong acids, Strong bases, Strong oxidizing agents, Strong reducing agents.

HAZARDOUS DECOMPOSITION PRODUCTS  
Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION  
Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE  
Skin Contact: Causes skin irritation.  
Skin Absorption: May be harmful if absorbed through the skin.  
Eye Contact: Causes severe eye irritation.  
Inhalation: May be harmful if inhaled. Material is irritating to mucous membranes and upper respiratory tract.  
Ingestion: Harmful if swallowed.

SENSITIZATION  
Sensitization: May cause allergic respiratory and skin reactions

TARGET ORGAN(S) OR SYSTEM(S)  
Liver. Kidneys.

SIGNS AND SYMPTOMS OF EXPOSURE  
Damage to the kidneys. Exposure to and/or consumption of alcohol may increase toxic effects. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. Damage to the liver. Prolonged exposure can cause:

TOXICITY DATA  

Oral  
Rat  
1530 mg/kg  
LD50  
Inhalation
Rat
> 210 mg/m³
LC50

Oral
Mouse
1500 mg/kg
LD50

Oral
Cat
800 mg/kg
LD50

Skin
Rabbit
> 10000 mg/kg
LD50

Intraperitoneal
Guinea pig
100 MG/KG
LD50

IRRITATION DATA

Skin
Rabbit
500 mg
24H
Remarks: Mild irritation effect

Eyes
Rabbit
50 mg
MOD
Remarks: Moderate irritation effect

NTP CARCINOGEN LIST

Rating: No evidence.
Species: Mouse/rat
Route: Feed

ACGIH CARCINOGEN LIST

Rating: A4

CHRONIC EXPOSURE - TERATOGEN

Species: Mouse
Dose: 203 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (8-10D PREG)
Result: Specific Developmental Abnormalities: Other
developmental abnormalities.

CHRONIC EXPOSURE - MUTAGEN

Species: Rat
Dose: 3 MMOL/L
Cell Type: liver
Mutation test: DNA damage

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat
Dose: 1 MG/M3
Route of Application: Inhalation
Exposure Time: (45D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct.
Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count).

Section 12 - Ecological Information

ACUTE ECOTOXICITY TESTS

Test Type: EC50 Algae
Species: Selenastrum capricornutum resp.
Time: 96 h
Value: 60.0 - 350.0 mg/l

Test Type: LC50 Fish
Species: Onchorhynchus mykiss (Rainbow trout)
Time: 60 d
Value: 44.4 - 48.3 mg/l

Test Type: LC0 Fish
Species: Onchorhynchus mykiss (Rainbow trout)
Time: 48 h
Value: 5 mg/l

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION
Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT
Proper Shipping Name: Environmentally hazardous substances, solid, n.o.s.
UN#: 3077
Class: 9
Packing Group: Packing Group III
Hazard Label: Class 9
PIH: Not PIH

IATA
Non-Hazardous for Air Transport: Non-hazardous for air transport.

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION
Symbol of Danger: Xn
Indication of Danger: Harmful.
Risk Statements: Harmful if swallowed. Irritating to respiratory system and skin. Risk of serious damage to eyes. May cause sensitization by inhalation and skin contact.

Safety Statements: Do not breathe spray. Avoid contact with skin and eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable gloves and eye/face protection. If swallowed, seek medical advice immediately and show this container or label.

US CLASSIFICATION AND LABEL TEXT
Indication of Danger: Harmful.
Risk Statements: Harmful if swallowed. Irritating to respiratory system and skin. Risk of serious damage to eyes. May cause sensitization by inhalation and skin contact.
Safety Statements: Do not breathe dust. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

UNITED STATES REGULATORY INFORMATION
SARA LISTED: Yes
DEMINIMIS: 1 %
NOTES: This product is subject to SARA section 313 reporting requirements.
TSCA INVENTORY ITEM: Yes

CANADA REGULATORY INFORMATION
WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: Yes
NDSL: No

Section 16 - Other Information

DISCLAIMER
For R&D use only. Not for drug, household or other uses.

WARRANTY
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. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2008 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.