SAFETY DATA SHEET
4,5-Difluorophthalic anhydride

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
Product name 4,5-Difluorophthalic anhydride
Product number FD67561
CAS number 18959-30-3
EC number 808-095-8

1.2. Relevant identified uses of the substance or mixture and uses advised against
Identified uses Laboratory reagent. Manufacture of substances. Research and development.

1.3. Details of the supplier of the safety data sheet
Supplier Carbosynth Ltd
8&9 Old Station Business Park
Compton
Berkshire
RG20 6NE
UK
+44 1635 578444
+44 1635 579444
info@carbosynth.com

1.4. Emergency telephone number
Emergency telephone +44 7887 998634

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture
Classification (EC 1272/2008)
Physical hazards Not Classified
Health hazards Skin Irrit. 2 - H315 Eye Irrit. 2 - H319
Environmental hazards Not Classified

2.2. Label elements
EC number 808-095-8

Pictogram

Signal word Warning
Hazard statements H315 Causes skin irritation.
H319 Causes serious eye irritation.
4,5-Difluorophthalic anhydride

Precautionary statements

P264 Wash contaminated skin thoroughly after handling.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P302+P352 IF ON SKIN: Wash with plenty of water.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

2.3. Other hazards

No data available.

SECTION 3: Composition/information on ingredients

3.1. Substances

Product name 4,5-Difluorophthalic anhydride
CAS number 18959-30-3
EC number 808-095-8
Chemical formula C₈H₂F₂O₃

SECTION 4: First aid measures

4.1. Description of first aid measures

General information Get medical advice/attention if you feel unwell.
Inhalation Remove person to fresh air and keep comfortable for breathing. If breathing stops, provide artificial respiration. When breathing is difficult, properly trained personnel may assist affected person by administering oxygen. Get medical attention if symptoms are severe or persist.
Ingestion Never give anything by mouth to an unconscious person. Rinse mouth thoroughly with water. Give plenty of water to drink. Get medical attention if symptoms are severe or persist.
Skin contact Remove contaminated clothing. Rinse with water. Continue to rinse for at least 15 minutes. Wash contaminated clothing before reuse. Get medical attention if symptoms are severe or persist.
Eye contact Rinse immediately with plenty of water. Continue to rinse for at least 15 minutes. Get medical attention if symptoms are severe or persist.

4.2. Most important symptoms and effects, both acute and delayed

General information See Section 11 for additional information on health hazards.

4.3. Indication of any immediate medical attention and special treatment needed

Notes for the doctor Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog. Use fire-extinguishing media suitable for the surrounding fire.

5.2. Special hazards arising from the substance or mixture

Specific hazards None known.
Hazardous combustion products Thermal decomposition or combustion products may include the following substances: Oxides of carbon. Hydrogen fluoride (HF).

5.3. Advice for firefighters
4,5-Difluorophthalic anhydride

**Special protective equipment for firefighters**
Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing. Firefighter's clothing conforming to European standard EN469 (including helmets, protective boots and gloves) will provide a basic level of protection for chemical incidents. Use protective equipment appropriate for surrounding materials.

**SECTION 6: Accidental release measures**

**6.1. Personal precautions, protective equipment and emergency procedures**

**Personal precautions**
Wear protective clothing as described in Section 8 of this safety data sheet. No action shall be taken without appropriate training or involving any personal risk. Do not touch or walk into spilled material. Avoid inhalation of dust and vapours. Provide adequate ventilation. Keep unnecessary and unprotected personnel away from the spillage.

**6.2. Environmental precautions**
Avoid discharge into drains or watercourses or onto the ground.

**6.3. Methods and material for containment and cleaning up**

**Methods for cleaning up**
Wear protective clothing as described in Section 8 of this safety data sheet. Collect powder using special dust vacuum cleaner with particle filter or carefully sweep into suitable waste disposal containers and seal securely. Clear up spills immediately and dispose of waste safely. Flush contaminated area with plenty of water. Wash thoroughly after dealing with a spillage. For waste disposal, see Section 13.

**6.4. Reference to other sections**
For personal protection, see Section 8. See Section 11 for additional information on health hazards. See Section 12 for additional information on ecological hazards. For waste disposal, see Section 13.

**SECTION 7: Handling and storage**

**7.1. Precautions for safe handling**

**Usage precautions**
Wear protective clothing as described in Section 8 of this safety data sheet. Wash hands thoroughly after handling. Provide adequate ventilation. Avoid generation and spreading of dust. Avoid contact with skin and eyes. Avoid inhalation of dust and vapours.

**7.2. Conditions for safe storage, including any incompatibilities**

**Storage precautions**
Keep container tightly closed. Store away from incompatible materials (see Section 10). Store contents under inert gas. Protect from moisture. Protect from light. Store at room temperature.

**7.3. Specific end use(s)**

**Specific end use(s)**
The identified uses for this product are detailed in Section 1.2.

**SECTION 8: Exposure Controls/personal protection**

**8.1. Control parameters**

**Occupational exposure limits**
No exposure limits known for ingredient(s).

**8.2. Exposure controls**

**Appropriate engineering controls**
Provide adequate ventilation. Observe any occupational exposure limits for the product or ingredients.

**Eye/face protection**
Unless the assessment indicates a higher degree of protection is required, the following protection should be worn: Tight-fitting safety glasses. Personal protective equipment for eye and face protection should comply with European Standard EN166.
4,5-Difluorophthalic anhydride

Hand protection
Wear protective gloves. To protect hands from chemicals, gloves should comply with European Standard EN374.

Other skin and body protection
Wear appropriate clothing to prevent repeated or prolonged skin contact.

Respiratory protection
Respiratory protection complying with an approved standard should be worn if a risk assessment indicates inhalation of contaminants is possible. Ensure all respiratory protective equipment is suitable for its intended use and is ‘CE’-marked. Particulate filters should comply with European Standard EN143. Full face mask respirators with replaceable filter cartridges should comply with European Standard EN136. Half mask and quarter mask respirators with replaceable filter cartridges should comply with European Standard EN140.

Environmental exposure controls
Keep container tightly sealed when not in use.

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Solid</td>
</tr>
<tr>
<td>Odour</td>
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<tr>
<td>Odour threshold</td>
<td>No data available.</td>
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<td>pH</td>
<td>No data available.</td>
</tr>
<tr>
<td>Melting point</td>
<td>97°C</td>
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<td>Initial boiling point and range</td>
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<tr>
<td>Flash point</td>
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<tr>
<td>Evaporation rate</td>
<td>No data available.</td>
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<tr>
<td>Flammability (solid, gas)</td>
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<tr>
<td>Upper/lower flammability or</td>
<td>No data available.</td>
</tr>
<tr>
<td>explosive limits</td>
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<tr>
<td>Vapour pressure</td>
<td>No data available.</td>
</tr>
<tr>
<td>Vapour density</td>
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</tr>
<tr>
<td>Relative density</td>
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<tr>
<td>Solubility(ies)</td>
<td>Soluble in the following materials: DMF</td>
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<tr>
<td>Partition coefficient</td>
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<tr>
<td>Auto-ignition temperature</td>
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<tr>
<td>Decomposition Temperature</td>
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<tr>
<td>Viscosity</td>
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<tr>
<td>Explosive properties</td>
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<tr>
<td>Oxidising properties</td>
<td>No data available.</td>
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</table>

9.2. Other information

<table>
<thead>
<tr>
<th>Property</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molecular weight</td>
<td>184.10</td>
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</tbody>
</table>

SECTION 10: Stability and reactivity

10.1. Reactivity
4,5-Difluorophthalic anhydride

Reactivity
No data available.

10.2. Chemical stability
Stability
Stable under the prescribed storage conditions.

10.3. Possibility of hazardous reactions
Possibility of hazardous reactions
No data available.

10.4. Conditions to avoid
Conditions to avoid
No data available.

10.5. Incompatible materials
Materials to avoid
Oxidising agents.

10.6. Hazardous decomposition products
Hazardous decomposition products

SECTION 11: Toxicological information

11.1. Information on toxicological effects
Acute toxicity - oral
Notes (oral LD₅₀)
Based on available data the classification criteria are not met.

Acute toxicity - dermal
Notes (dermal LD₅₀)
Based on available data the classification criteria are not met.

Acute toxicity - inhalation
Notes (Inhalation LD₅₀)
Based on available data the classification criteria are not met.

Skin corrosion/irritation
Animal data
Irritating.

Serious eye damage/irritation
Causes serious eye irritation.

Respiratory sensitisation
Based on available data the classification criteria are not met.

Skin sensitisation
Based on available data the classification criteria are not met.

Germ cell mutagenicity
Based on available data the classification criteria are not met.

Genotoxicity - in vitro
Based on available data the classification criteria are not met.

Carcinogenicity
Based on available data the classification criteria are not met.

IARC carcinogenicity
None of the ingredients are listed or exempt.

Reproductive toxicity
Based on available data the classification criteria are not met.

Specific target organ toxicity - single exposure
**4,5-Difluorophthalic anhydride**

<table>
<thead>
<tr>
<th><strong>STOT - single exposure</strong></th>
<th>Not classified as a specific target organ toxicant after a single exposure.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specific target organ toxicity - repeated exposure</strong></td>
<td></td>
</tr>
<tr>
<td><strong>STOT - repeated exposure</strong></td>
<td>Not classified as a specific target organ toxicant after repeated exposure.</td>
</tr>
<tr>
<td><strong>Aspiration hazard</strong></td>
<td>Not relevant. Solid.</td>
</tr>
</tbody>
</table>

**General information**
Dust may irritate the eyes and the respiratory system. The severity of the symptoms described will vary dependent on the concentration and the length of exposure.

**Inhalation**
Dust may irritate the respiratory system. Frequent inhalation of dust over a long period of time increases the risk of developing lung diseases.

**Ingestion**
May cause irritation.

**Skin contact**
Redness. Irritating to skin.

**Eye contact**
Irritating to eyes.

**Route of exposure**
Ingestion Inhalation Skin and/or eye contact

**Target organs**
No specific target organs known.

### SECTION 12: Ecological Information

**Ecotoxicity**
Not regarded as dangerous for the environment. However, large or frequent spills may have hazardous effects on the environment.

#### 12.1. Toxicity

**Toxicity**
Based on available data the classification criteria are not met.

#### 12.2. Persistence and degradability

**Persistence and degradability**
The degradability of the product is not known.

#### 12.3. Bioaccumulative potential

**Bioaccumulative potential**
No data available on bioaccumulation.

**Partition coefficient**
No data available.

#### 12.4. Mobility in soil

**Mobility**
No data available.

#### 12.5. Results of PBT and vPvB assessment

**Results of PBT and vPvB assessment**
No data available.

#### 12.6. Other adverse effects

**Other adverse effects**
None known.

### SECTION 13: Disposal considerations

#### 13.1. Waste treatment methods

**General information**
Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority. This material and its container must be disposed of in a safe way. When handling waste, the safety precautions applying to handling of the product should be considered.
4,5-Difluorophthalic anhydride

SECTION 14: Transport information

General
The product is not covered by international regulations on the transport of dangerous goods (IMDG, IATA, ADR/RID).

14.1. UN number
Not applicable.

14.2. UN proper shipping name
Not applicable.

14.3. Transport hazard class(es)
No transport warning sign required.

14.4. Packing group
Not applicable.

14.5. Environmental hazards
Environmentally hazardous substance/marine pollutant
No.

14.6. Special precautions for user
Not applicable.

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
National regulations
Health and Safety at Work etc. Act 1974 (as amended).
The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (SI 2009 No. 1348) (as amended) ["CDG 2009"].
EH40/2005 Workplace exposure limits.

EU legislation

15.2. Chemical safety assessment
No chemical safety assessment has been carried out.

SECTION 16: Other information
4,5-Difluorophthalic anhydride

**Abbreviations and acronyms used in the safety data sheet**

- **ADR**: European Agreement concerning the International Carriage of Dangerous Goods by Road.
- **ADN**: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways.
- **RID**: European Agreement concerning the International Carriage of Dangerous Goods by Rail.
- **IATA**: International Air Transport Association.
- **ICAO**: Technical Instructions for the Safe Transport of Dangerous Goods by Air.
- **IMDG**: International Maritime Dangerous Goods.
- **CAS**: Chemical Abstracts Service.
- **ATE**: Acute Toxicity Estimate.
- **LC₅₀**: Lethal Concentration to 50 % of a test population.
- **LD₅₀**: Lethal Dose to 50% of a test population (Median Lethal Dose).
- **EC₅₀**: 50% of maximal Effective Concentration.
- **PBT**: Persistent, Bioaccumulative and Toxic substance.
- **vPvB**: Very Persistent and Very Bioaccumulative.

**Training advice**
Only trained personnel should use this material.

**Revision date**
01/02/2018

**Revision**
1

**SDS number**
144926

**Hazard statements in full**
- H315 Causes skin irritation.
- H319 Causes serious eye irritation.

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty, guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.