SAFETY DATA SHEET
2-Chlorobenzylidene malononitrile

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

1.1. Product identifier
Product name 2-Chlorobenzylidene malononitrile
Product number FC20204
Synonyms; trade names 2-[(2-Chlorophenyl)methylene]propanedinitrile, (o-Chlorobenzylidene)malononitrile, [(2-Chlorophenyl)methylene] propanedinitrile
CAS number 2698-41-1
EC number 220-278-9

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 Acute Tox. 3 - H301 Resp. Sens. 1 - H334 Skin Sens. 1 - H317
Environmental hazards Aquatic Acute 1 - H400 Aquatic Chronic 1 - H410

2.2. Label elements
EC number 220-278-9
Pictogram

Signal word Danger
2-Chlorobenzylidene malononitrile

Hazard statements
H301 Toxic if swallowed.
H317 May cause an allergic skin reaction.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements
P270 Do not eat, drink or smoke when using this product.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P302+P352 IF ON SKIN: Wash with plenty of water.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P501 Dispose of contents/ container in accordance with national regulations.

2.3. Other hazards
No data available.

SECTION 3: Composition/information on ingredients

3.1. Substances
Product name 2-Chlorobenzylidene malononitrile
CAS number 2698-41-1
EC number 220-278-9
Chemical formula C₁₀H₅ClN₂

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 Do not induce vomiting. 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
2-Chlorobenzylidene malononitrile

Specific hazards
None known.

Hazardous combustion products
Thermal decomposition or combustion products may include the following substances: Oxides of carbon. Oxides of nitrogen. Hydrogen chloride (HCl). Cyanides.

5.3. Advice for firefighters
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
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
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. Do not eat, drink or smoke when using this product.

7.2. Conditions for safe storage, including any incompatibilities
Storage precautions
Keep container tightly closed. Store contents under inert gas. Store away from incompatible materials (see Section 10). Eliminate all sources of ignition. Store at temperatures between 2°C and 8°C.

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

8.2. Exposure controls
Appropriate engineering controls
Provide adequate ventilation. Observe any occupational exposure limits for the product or ingredients.
### 2-Chlorobenzylidene malononitrile

#### 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.

#### 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

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<thead>
<tr>
<th>Property</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Solid.</td>
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<tr>
<td>Colour</td>
<td>White/off-white.</td>
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<td>Odour</td>
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<td>Odour threshold</td>
<td>No data available.</td>
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<tr>
<td>pH</td>
<td>No data available.</td>
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<tr>
<td>Melting point</td>
<td>89 to 100°C</td>
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<tr>
<td>Initial boiling point and range</td>
<td>310 to 315°C</td>
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<td>Flash point</td>
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<tr>
<td>Evaporation rate</td>
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<td>Flammability (solid, gas)</td>
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<td>Upper/lower flammability or explosive limits</td>
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<td>Vapour pressure</td>
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<td>Vapour density</td>
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<td>Relative density</td>
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<td>Solubility(ies)</td>
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<td>Partition coefficient</td>
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<td>Decomposition Temperature</td>
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<td>Viscosity</td>
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<td>Explosive properties</td>
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<tr>
<td>Oxidising properties</td>
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</table>
2-Chlorobenzylidene malononitrile

9.2. Other information

Molecular weight 188.61

SECTION 10: Stability and reactivity

10.1. Reactivity

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 Dust/Mist

10.5. Incompatible materials

Materials to avoid Strong oxidising agents. Strong acids.

10.6. Hazardous decomposition products


SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity - oral

Notes (oral LD₅₀) Acute Tox. 3 - H301 Toxic if swallowed.
ATE oral (mg/kg) 100.0

Acute toxicity - dermal

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

Acute toxicity - inhalation

Notes (inhalation LC₅₀) Based on available data the classification criteria are not met.

Skin corrosion/irritation

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

Serious eye damage/irritation

Serious eye damage/irritation Based on available data the classification criteria are not met.

Respiratory sensitisation

Respiratory sensitisation There is evidence that the product can cause respiratory hypersensitivity.

Skin sensitisation

Skin sensitisation May cause skin sensitisation or allergic reactions in sensitive individuals.

Germ cell mutagenicity

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

Carcinogenicity

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

IARC carcinogenicity None of the ingredients are listed or exempt.
2-Chlorobenzylidene malononitrile

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

Specific target organ toxicity - single exposure
STOT - single exposure Not classified as a specific target organ toxicant after a single exposure.

Specific target organ toxicity - repeated exposure
STOT - repeated exposure Not classified as a specific target organ toxicant after repeated exposure.

Aspiration hazard
Aspiration hazard Not relevant. Solid.

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
May cause sensitisation or allergic reactions in sensitive individuals. 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 sensitisation or allergic reactions in sensitive individuals. May cause stomach pain or vomiting. May cause severe internal injury.

Skin contact
May cause skin sensitisation or allergic reactions in sensitive individuals. Prolonged contact may cause dryness of the skin.

Eye contact
Dust may cause slight irritation.

Route of exposure
Ingestion Inhalation Skin and/or eye contact

Target organs
No specific target organs known.

Medical considerations
Skin disorders and allergies.

RTECS # OO3675000

SECTION 12: Ecological Information

Ecotoxicity
Very toxic to aquatic life with long lasting effects.

12.1. Toxicity
Toxicity
This product contains a substance that has not yet been fully tested and may have unforeseen effects.

Acute aquatic toxicity
LE(C)₅₀ 0.1 < L(E)C₅₀ ≤ 1
M factor (Acute) 1

Chronic aquatic toxicity
NOEC 0.01 < NOEC ≤ 0.1
Degradability Non-rapidly degradable
M factor (Chronic) 1

12.2. Persistence and degradability
Persistence and degradability The degradability of the product is not known.
2-Chlorobenzylidene malononitrile

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.
Disposal methods: Mix or dissolve the material in a combustible solvent and burn in chemical incinerator equipped with an afterburner and scrubber.

SECTION 14: Transport information

14.1. UN number
UN No. (ADR/RID) 3448
UN No. (IMDG) 3448
UN No. (ICAO) 3448
UN No. (ADN) 3448

14.2. UN proper shipping name

14.3. Transport hazard class(es)
ADR/RID class 6.1
ADR/RID classification code T2
ADR/RID label 6.1
IMDG class 6.1
ICAO class/division 6.1
ADN class 6.1

Transport labels

14.4. Packing group
ADR/RID packing group II
2-Chlorobenzylidene malononitrile

IMDG packing group II
ADN packing group II
ICAO packing group II

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

14.6. Special precautions for user
EmS F-A, S-A
ADR transport category 2
Emergency Action Code 2X
Hazard Identification Number 60
(ADR/RID)

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

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.

Inventories
US - TSCA
Present.

SECTION 16: Other information
2-Chlorobenzylidene malononitrile

**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**

15/03/2018

**Revision**

1

**SDS number**

144926

**Hazard statements in full**

- **H301**: Toxic if swallowed.
- **H317**: May cause an allergic skin reaction.
- **H334**: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
- **H400**: Very toxic to aquatic life.
- **H410**: Very toxic to aquatic life with long lasting effects.

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.