1 IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Substance name: Calcium Acetylide
Synonyms: Calcium Carbide. Acetylenogen; Calcium Dicarbide.
Chemical name and formula: Calcium Carbide / C2Ca
Trade name: Carburo de calcio
CAS: 75-20-7
EINECS: 200-848-3
Molecular Weight: 64.1 g/mol

1.2 Relevant identified uses of the substance or mixture and uses advised against

1.2.1 Formulation: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

1.2.2 Intermediate in the production of acetylene and calcium cyanamide: Use in closed, continuous process with occasional controlled exposure.

Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.

1.2.3 Use of calcium carbide in metallurgy: Potentially closed processing operations with minerals/metals at elevated temperature. Industrial setting.

1.2.4 Uses advises against: There are no uses advised against.

1.3 Details of the supplier of the safety data sheet

Name: Carburo del Cinca, SA.
Address: CN-240, Km. 147, 22400, Monzón, Huesca, Spain
Phone N°: +34 974403311
Fax N°: +34 974402083
E-mail of competent person responsible for SDS in the MS or in the EU: info@cacisa.com
1.4 Emergency telephone number

European Emergency N°: 112
National centre for Prevention and Treatment of Intoxications N°: +91 5620420
Emergency telephone at the company +34 974403311
Available outside office hours: x Yes □ No

2 HAZARDS IDENTIFICATION

2.1 Classification of the substance

2.1.1 Classification according to Regulation (EC) 1272/2008
Water React. Flam. Gas 1
STOT Single Exp. 3, Route of exposure: Inhalation
Skin Irritation 2
Eye Damage 1

2.1.2 Classification according to Directive 67/548/EEC
F; R15 Highly flammable; Contact with water liberates extremely flammable gases.

2.2 Label elements

2.2.1 Labelling according to Regulation (EC) 1272/2008

Signal word: Danger

Hazard pictogram:
Hazard statements:

H260: In contact with water releases flammable gases which may ignite spontaneously.
H315: Causes skin irritation
H318: Causes serious eye damage
H335: May cause respiratory irritation

Precautionary statements:

P280: Wear protective gloves/protective clothing/eye protection/face protection
P305+P351+P310: IF IN EYES: Rinse cautiously with water for several minutes. Immediately call a POISON CENTRE or doctor/physician
P302+P352: IF ON SKIN: Wash with plenty of water
P261: Avoid breathing dust/spray
P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
P501: Dispose of contents/container in accordance with local/regional/national/international regulation (ADR)
P312: Call a POISON CENTER or doctor/physician if you feel unwell.
P405: Store locked up.
P403+P233: Store in a well-ventilated place. Keep container tightly closed.
P271: Use only outdoors or in a well-ventilated area.
P362: Take off contaminated clothing and wash before reuse.
P332+P313: If skin irritation occurs: Get medical advice/attention.
P264: Wash skin thoroughly after handling.
P310: Immediately call a POISON CENTER or doctor/physician.
P402+P404: Store in a dry place. Store in a closed container.
P335+P334: Brush off lose particles from skin. Immerse in cool water/wrap in wet bandages.
P231+P232: Handle under inert gas. Protect from moisture.
P223: Keep away from any possible contact with water, because of violent reaction and possible flash fire.
P370+P378: In case of fire: Use sand or dry powder for extinction.
2.2.2 Labelling according to Directive 67/548/EEC

Indication of danger:

F - highly flammable

Risk phrases:
R15  Contact with water liberates extremely flammable gases

Safety phrases:
S2:  Keep out of the reach of children
S8   Keep container dry
S43  In case of fire, use sand or dry powder for extinction. Never use water

2.3 Other hazards

The substance does not meet the criteria for PBT or vPvB substance.
No other hazards identified.

3  COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Main constituent
Name: Calcium carbide, Calcium acetylide
CAS: 75-20-7
EINECS: 200-848-3

Impurities
No impurities relevant for classification and labelling.
4 FIRST AID MEASURES

4.1 Description of first aid measures

If substance has got into eyes, wash out with water for at least 15 minutes and seek immediate medical attention.

Persons who have been in contact with the substance or have inhaled fumes should get immediate medical attention. Pass on all available product information.

In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing adhering to skin.

Remove contaminated clothing immediately and wash affected skin with soap and plenty of water.

5 FIREFIGHTING MEASURES

Extinguish with dry agent.

Do not use water, foam or carbon dioxide to extinguish.

6 ACCIDENTAL RELEASE MEASURES

Stop leaks if possible.

Contain spillage by any means available.

If substance has entered a water course or sewer, inform the responsible authority.

7 HANDLING AND STORAGE

Handle under inert gas. Protect from moisture.

Keep away from any possible contact with water, because of violent reaction and possible flash fire.

Store in a dry place.

Store in a well-ventilated place.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

The decomposition of calcium carbide in the presence of moisture means that systemic exposure to parent substance will not occur. Systemic effects from exposure to the breakdown products are not expected, and the main effects resulting from contact will be local effects as result of skin irritation due to calcium oxide present as an impurity, and the calcium hydroxide decomposition product. The
toxicity of the impurities of calcium carbide has been considered and is discussed in detail in the expert report (Fisk and Barnes (2010)), and it is concluded that the irritant effects are the lead health effect. There is insufficient data to calculate a DNEL, so the indicative occupational exposure limit (IOEL) for calcium hydroxide will be used in the risk characterisation. The IOEL is 5 mg/m³ based on an 8 hour TWA reference period (http://ec.europa.eu/social/BlobServlet?docId=4080&langId=en). Exposure to areas where dust is greatest is for a maximum of 4 hours, so the IOEL is adjusted to 10 mg/m³ to take this into account.

8.2 Exposure controls

To control potential exposures, generation of dust should be avoided. Further, appropriate protective equipment is recommended. Eye protection equipment (e.g. goggles or visors) must be worn, unless potential contact with the eye can be excluded by the nature and type of application (i.e. closed process). Additionally, face protection, protective clothing and safety shoes are required to be worn as appropriate.

8.2.1 Appropriate engineering controls

If user operations generate dust, use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne dust levels below recommended exposure limits.

8.2.2 Individual protection measures, such as personal protective equipment

8.2.2.1 Eye/face protection

Do not wear contact lenses. For powders, tight fitting goggles with side shields, or wide vision full goggles. It is also advisable to have individual pocket eyewash.

8.2.2.2 Skin protection

Since calcium carbide is classified as irritating to skin, dermal exposure has to be minimised as far as technically feasible. The use of protective gloves (nitrile), protective standard working clothes fully covering skin, full length trousers, long sleeved overalls, with close fittings at openings and shoes resistant to caustics and avoiding dust penetration are required to be worn.

8.2.2.3 Respiratory protection

Local ventilation to keep low levels below. A suitable particle filter mask is recommended, depending on the expected exposure levels.

8.2.2.4 Thermal hazards

The substance does not represent a thermal hazard, thus special consideration is not required.

8.2.3 Environmental exposure controls

All ventilation systems should be filtered before discharge to atmosphere.
Avoid releasing to the environment.  
Contain the spillage. Any large spillage into watercourses must be alerted to the regulatory authority responsible for environmental protection or other regulatory body. 
For detailed explanations of the risk management measures that adequately control exposure of the environment to the substance please check the relevant exposure scenario, available via your supplier.

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>Grey solid material of varying sizes: Lump, granular or fine powder</td>
</tr>
<tr>
<td>Odour</td>
<td>Garlic</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>not applicable</td>
</tr>
<tr>
<td>pH</td>
<td>12.3 (saturated solution at 20 °C)</td>
</tr>
<tr>
<td>Melting point</td>
<td>2.300 °C (pure substance)</td>
</tr>
<tr>
<td>Boiling point</td>
<td>not applicable (solid with a melting point &gt; 300 °C)</td>
</tr>
<tr>
<td>Flash point</td>
<td>not applicable (does not need to be conducted as the substance is inorganic.)</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>not applicable (solid with a melting point &gt; 300 °C)</td>
</tr>
<tr>
<td>Flammability</td>
<td>not applicable (the substance decomposes rapidly producing flammable gas on contact with moisture.)</td>
</tr>
<tr>
<td>Explosive limits</td>
<td>non explosive (the substance decomposes rapidly producing flammable gas on contact with moisture.)</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>not applicable (solid with a melting point &gt; 300 °C)</td>
</tr>
<tr>
<td>Vapour density</td>
<td>not applicable</td>
</tr>
<tr>
<td>Relative density</td>
<td>2.22 gr/cm²</td>
</tr>
<tr>
<td>Solubility in water</td>
<td>not applicable the substance has a hydrolytic half-life less than 12 hours at pH 4, 7 and 9.</td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>not applicable (inorganic substance)</td>
</tr>
<tr>
<td>Auto ignition temperature</td>
<td>not applicable the substance decomposes rapidly producing flammable gas on contact with moisture.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>not applicable (as the substance is a solid at standard temperature and pressure; viscosity is only relevant for liquids.)</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>not applicable (the substance is incapable of reacting exothermically with combustible materials on the basis of chemical structure)</td>
</tr>
</tbody>
</table>
10 STABILITY AND REACTIVITY

10.1 Reactivity
Calcium carbide reacts exothermically with water to form Calcium dihydroxide and acetylene

10.2 Chemical stability
Under normal conditions of use and storage (dry conditions), calcium carbide is stable.

10.3 Possibility of hazardous reactions
Calcium carbide reacts exothermically with acids to form calcium salts.

10.4 Conditions to avoid
Minimise exposure to air and moisture to avoid degradation.

10.5 Incompatible materials
Calcium carbide reacts exothermically with water to form calcium dihydroxide and acetylene
\[ C_2Ca + H_2O \rightarrow Ca(OH)_2 + C_2H_2 \]
Calcium carbide reacts exothermically with acids to form calcium salts.
Calcium carbide reacts with sulphur, magnesium, silver nitrate, selenium, lead fluoride, sodium peroxide, and tin (II) chloride.

Acetylene forms an explosive compound with copper and his compounds, brass, silver, or mercury and his salts, holgen, nitric acid, sodium hydride, cobalt, potassium, rubidium hydride and cesium hydride.

10.6 Hazardous decomposition products
Acetylene and calcium dihydroxide
Further information: calcium dihydroxide absorbs moisture and carbon dioxide from air to form calcium carbonate, which is a common material in nature.

11 TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects
Calcium carbide is classified as irritating to skin and the respiratory tract and it entails a risk of serious damage to the eye. The decomposition of calcium carbide in the presence of moisture means that systemic exposure to parent substance will not occur. Systemic effects from exposure to the breakdown products are not expected, and the main effects resulting from contact will be local effects as result of skin irritation due to calcium oxide present as an impurity, and the calcium hydroxide
decomposition product. The toxicity of the impurities of calcium carbide has been considered and is discussed in detail in the expert report (Fisk and Barnes 2010), and it is concluded that the irritant effects are the critical health effect. There is insufficient data to calculate a DNEL, so the indicative occupational exposure limit (IOEL) for the hydrolysis product calcium hydroxide will be used in the risk characterisation. The IOEL is 5 mg/m³ based on an 8 hour TWA reference period (http://ec.europa.eu/social/BlobServlet?docId=4080&langId=en). Exposure to areas where dust is greatest is for a maximum of 4 hours, so the IOEL is adjusted to 10 mg/m³ to take this into account.

<table>
<thead>
<tr>
<th>Toxity endpoints</th>
<th>Outcome of the effects assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acute toxicity</strong></td>
<td>Oral</td>
</tr>
<tr>
<td>In accordance with OECD TG 423, the pH of calcium carbide in water was determined. The resulting solution, which was not analysed but which is assumed by the reviewer to be composed of impurities and breakdown products, had a pH of 12.48. On the basis of this pH result, the test in animals was not carried out.</td>
<td></td>
</tr>
<tr>
<td>Dermal</td>
<td></td>
</tr>
<tr>
<td>In accordance with OECD TG 402, the pH of calcium carbide in water was determined. The resulting solution, which was not analysed but which is assumed by the reviewer to be composed of impurities and breakdown products, had a pH of 12.48. On the basis of this pH result, the test in animals was not carried out.</td>
<td></td>
</tr>
<tr>
<td>Inhalation</td>
<td></td>
</tr>
<tr>
<td>the study does not need to be conducted as the substance decomposes rapidly producing flammable gas on contact with moisture. Classification for acute toxicity is not warranted.</td>
<td></td>
</tr>
<tr>
<td>For irritating effects to the respiratory tract see below.</td>
<td></td>
</tr>
</tbody>
</table>
## Toxicity endpoints

<table>
<thead>
<tr>
<th>Irritation / corrosion</th>
<th>Outcome of the effects assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The results of pH evaluation of calcium carbide in water suggest that classification as corrosive should be considered. Testing in vivo is not considered appropriate on the basis of pH. In vivo data is available from in vivo testing of calcium dihydroxide.</td>
</tr>
</tbody>
</table>

- In vivo skin irritation studies (rabbit) indicate that calcium dihydroxide is irritating to skin.
- Data from in vivo eye irritation studies in the rabbit show that calcium dihydroxide caused irreversible lesions in the eye.
- Data are available that indicate that calcium dihydroxide is irritating to the respiratory tract.
- The high pH of 1% calcium carbide in water results from formation of calcium dihydroxide by hydrolysis of calcium carbide and the impurity calcium oxide. It is therefore considered that read-across of the experimental results from calcium dihydroxide to calcium carbide is appropriate. These results supersede classification on the basis of pH.

Based on experimental results for the read-across substance, calcium dihydroxide, calcium carbide requires classification as follows:

- Irritating to skin [R38, irritating to skin; Skin Irrit 2 (H315 – Causes skin irritation)].
- Severely irritating to the eye [R41, Risk of serious damage to eye; Eye Damage 1 (H318 - Causes serious eye damage)].
- Calcium carbide contains calcium oxide as an impurity, and hydrolyses in contact with moisture forming calcium hydroxide.

Based on human data for calcium dihydroxide, it is proposed to classify calcium carbide as irritating to the respiratory system [R37, Irritating to respiratory system; STOT SE 3 (H335 - May cause respiratory irritation)].

## Sensitisation

In accordance with Section 2 of REACH Annex XI, sensitisation studies do not need to be conducted as the substance decomposes rapidly producing flammable gas on contact with moisture. An assessment of the potential for skin sensitisation of calcium carbide considered that the substance is not a skin sensitiser, based on information on the substance, its impurities and breakdown products.
**Toxicity endpoints** | **Outcome of the effects assessment**
---|---
**Repeated dose toxicity** | None of the impurities and breakdown products of calcium carbide are classified for repeated dose toxicity, and there is no information to indicate that classification of any of the impurities and breakdown products is required. Testing of calcium carbide is not appropriate as it produces a flammable gas in contact with moisture. Therefore it is considered that classification for repeated dose toxicity is not justified.

**Mutagenicity** | Calcium carbide is not considered to be mutagenic and the only available information does not indicate a direct link between exposure to calcium carbide and incidence of cancer. Therefore it is considered that classification for carcinogenicity is not justified.

**Carcinogenicity** | A study of workers at a single calcium carbide plant showed a decrease in stomach cancer and a significant excess of colonic cancer (standardised incidence ratio (SIR) 2.09) and prostatic cancer (SIR 1.56). In view of the confounding factors, the lack of compositional and exposure information, and the lack of any mechanisms, it is not considered that this study is evidence for carcinogenicity. IARC have reviewed these data in consideration of possible carcinogenicity of PAHs and found that they are not not classifiable as to their carcinogenicity to humans (Group 3).

Testing of calcium carbide is not appropriate on the grounds of production of flammable gas following contact with moisture. The contribution of the impurities and products of hydrolysis to the potential for carcinogenicity has been considered and is discussed in detail in Fisk and Barnes 2010. Calcium carbide contains no impurities that are classified for carcinogenicity at concentrations over 0.1%.

**Toxicity for reproduction** | Calcium carbide contains no impurities that are classified for toxicity to reproduction, developmental toxicity or teratogenicity, and there is no information available to suggest that classification is required. In addition, due to the inorganic, irritant nature of calcium carbide, it is considered that there will be no uptake following exposure, therefore exposure of reproductive organs will not occur.
12 ECOLOGICAL INFORMATION

12.1 Toxicity

Calcium carbide is unlikely to have direct toxic effects on aquatic organisms. The aquatic toxicity of the breakdown products and impurities of commercially produced calcium carbide are discussed in detail in Fisk and Barnes (2010). The only substances that are present in sufficient quantities to be of concern for aquatic toxicity are calcium sulfide and calcium cyanamide. The PNEC for calcium sulfide has been derived from the NOEC for hydrogen sulfide. Data available in the public domain for cyanamide have been used to derive a PNEC for calcium cyanamide assuming 100% conversion to cyanamide.

12.1.1 Acute/Prolonged toxicity to fish

In accordance with Column 2 of REACH Annex IX, the long-term aquatic toxicity to fish study does not need to be conducted as the chemical safety assessment according to Annex I indicates that this is not necessary.

12.1.2 Acute/Prolonged toxicity to aquatic invertebrates

In accordance with Column 2 of REACH Annex IX, the toxicity to aquatic invertebrates study does not need to be conducted as the chemical safety assessment according to Annex I indicates that this is not necessary.

12.1.3 Toxicity to micro-organisms e.g. bacteria

In accordance with Column 2 of REACH Annex IX, long-term toxicity testing with microorganisms is not needed as the chemical safety assessment according to Annex I indicates that this is not necessary.

12.1.4 Toxicity to soil dwelling organisms

In accordance with Column 2 of REACH Annex IX, long-term toxicity testing with soil microorganisms is not needed as the chemical safety assessment according to Annex I indicates that this is not necessary.

12.1.5 Toxicity to terrestrial plants

In accordance with Column 2 of REACH Annex X, long-term toxicity testing with terrestrial plants is not needed as the chemical safety assessment according to Annex I indicates that this is not necessary.
12.1.6 General effect

Acute pH-effect. Although this product is useful to correct water acidity, an excess of more than 1 g/l may be harmful to aquatic life. pH-value of > 12 will rapidly decrease as result of dilution and carbonation.

12.2 Persistence and degradability

Not relevant for inorganic substances

12.3 Bioaccumulative potential

Not relevant for inorganic substances

12.4 Mobility in soil

Calcium carbide reacts with water and/or carbon dioxide to form respectively calcium dihydroxide and/or calcium carbonate, which are sparingly soluble, and present a low mobility in most soils.

12.5 Results of PBT and vPvB assessment

Not relevant for inorganic substances

12.6 Other adverse effects

No other adverse effects are identified

13 DISPOSAL CONSIDERATIONS

Dispose of contents/container at authorised disposal sites in accordance with national/international regulation

14 TRANSPORT INFORMATION

Calcium carbide is classified as hazardous for transport (ADR (Road), RID (Rail), IMDG / GGVSea (Sea).

14.1 UN-Number

UN 1402

Land transport (ADR/RID/)

UN number 1402

Class 4.3

Classification code W2

Packaging group I
Labels Nº 4.3
Inland waterway transport (AND(R))
UN number 1402
Class 4.3
Classification code W2
Packaging group I

Labels 4.3
Marine transport (IMDG)
UN number 1402
Chemical name Calcium Carbide
Class 4.3
Packaging group I
EmS number F-G, S-N

Labels 4.3
Air transport ICAO/IATA
UN number 1402
Chemical name Calcium carbide
Class 4.3
Packaging group I
Labels 4.3
REGULATORY INFORMATION

Labelling according 67/548/EC Directive

Hazard pictogram:

F flammable.
Risk phrases:
R15 Contact with water liberates extremely flammable gases
Safety phrases:
S2: Keep out of the reach of children
S8 Keep container dry
S43 In case of fire, use sand or dry powder for extinction. Never use water

Labelling according CLP 1272/2008

Signal word: Danger

Hazard pictogram:
Hazard statements:

H260: In contact with water releases flammable gases which may ignite spontaneously.

H315: Causes skin irritation

H318: Causes serious eye damage

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Precautionary statements:

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P305+P351+P310: IF IN EYES: Rinse cautiously with water for several minutes. Immediately call a POISON CENTRE or doctor/physician

P302+P352: IF ON SKIN: Wash with plenty of water

P261: Avoid breathing dust/spray

P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

P501: Dispose of contents/container in accordance with local/regional/national/international regulation (ADR)

P312: Call a POISON CENTER or doctor/physician if you feel unwell.

P405: Store locked up.

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P271: Use only outdoors or in a well-ventilated area.

P362: Take off contaminated clothing and wash before reuse.

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P231+P232: Handle under inert gas. Protect from moisture.

P223: Keep away from any possible contact with water, because of violent reaction and possible flash fire.

P370+P378: In case of fire: Use sand or dry powder for extinction.
16 OTHER INFORMATION

Data are based on our latest knowledge but do not constitute a guarantee for any specific product features and do not establish a legally valid contractual relationship.

Disclaimer

This safety data sheet (SDS) is based on the legal provisions of the REACH Regulation (EC 1907/2006; article 31 and Annex II), as amended. Its contents are intended as a guide to the appropriate precautionary handling of the material. It is the responsibility of recipients of this SDS to ensure that the information contained therein is properly read and understood by all people who may use, handle, dispose or in any way come in contact with the product. Information and instructions provided in this SDS are based on the current state of scientific and technical knowledge at the date of issue indicated. It should not be construed as any guarantee of technical performance, suitability for particular applications, and does not establish a legally valid contractual relationship. This version of the SDS supersedes all previous versions.