

# Aluminum carbide

sc-239216



The Power is Question

## Material Safety Data Sheet

Hazard Alert Code Key: **EXTREME** **HIGH** **MODERATE** **LOW**

## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT NAME

Aluminum carbide

### STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

### NFPA



### SUPPLIER

Santa Cruz Biotechnology, Inc.  
2145 Delaware Avenue  
Santa Cruz, California 95060  
800.457.3801 or 831.457.3800

### EMERGENCY

ChemWatch  
Within the US & Canada: 877-715-9305  
Outside the US & Canada: +800 2436 2255  
(1-800-CHEMCALL) or call +613 9573 3112

### SYNONYMS

Al4-C3, "aluminum carbide", "tetraaluminium tricarbide"

## Section 2 - HAZARDS IDENTIFICATION

### CHEMWATCH HAZARD RATINGS

	Min	Max
Flammability:	3	
Toxicity:	0	
Body Contact:	2	
Reactivity:	1	
Chronic:	2	

Min/Nil=0  
Low=1  
Moderate=2  
High=3  
Extreme=4



### CANADIAN WHMIS SYMBOLS



## EMERGENCY OVERVIEW

### RISK

Contact with water liberates extremely flammable gases.  
Irritating to eyes, respiratory system and skin.  
Highly flammable.

### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

##### SWALLOWED

■ The material has NOT been classified as "harmful by ingestion".  
This is because of the lack of corroborating animal or human evidence.

##### EYE

■ This material can cause eye irritation and damage in some persons.

##### SKIN

- This material can cause inflammation of the skin on contact in some persons.
- The material may accentuate any pre-existing dermatitis condition.
- Skin contact is not thought to have harmful health effects, however the material may still produce health damage following entry through wounds, lesions or abrasions.
- Open cuts, abraded or irritated skin should not be exposed to this material.
- Solution of material in moisture on the skin, or perspiration, may increase irritant effects.
- Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.  
Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

##### INHALED

- The material can cause respiratory irritation in some persons.  
The body's response to such irritation can cause further lung damage.
- Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.

##### CHRONIC HEALTH EFFECTS

■ Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems. Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung.

Exposure to large doses of Aluminum has been connected with the degenerative brain disease Alzheimer's Disease.

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
aluminium carbide	1299-86-1	> 95
NOTE: In presence of moisture decomposes to		
generate;		
<a href="#">methane</a>	74-82-8	

## Section 4 - FIRST AID MEASURES

##### SWALLOWED

· Immediately give a glass of water. · First aid is not generally required. If in doubt, contact a Poisons Information Center or a doctor.

##### EYE

■ If this product comes in contact with the eyes: · Wash out immediately with fresh running water. · Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

##### SKIN

■ If skin contact occurs: · Immediately remove all contaminated clothing, including footwear · Flush skin and hair with running water (and soap if available).

##### INHALED

· If fumes or combustion products are inhaled remove from contaminated area. · Lay patient down. Keep warm and rested.

##### NOTES TO PHYSICIAN

■ Treat symptomatically.

## Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG):	Negligible
Upper Explosive Limit (%):	Not available

Specific Gravity (water=1):	2.36
Lower Explosive Limit (%):	Not available

**EXTINGUISHING MEDIA**

■ DO NOT USE WATER, CO2 OR FOAM ON SUBSTANCE ITSELF

For SMALL FIRES:

- Dry chemical, soda ash or lime.

For LARGE FIRES:

- DRY sand, dry chemical, soda ash;

**FIRE FIGHTING**

- Alert Emergency Responders and tell them location and nature of hazard.
- May be violently or explosively reactive.

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 800 metres in all directions.

**GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS**

- May ignite on contact with air, moist air or water.
- May react vigorously or explosively on contact with water.

Combustion products include: carbon dioxide (CO2), other pyrolysis products typical of burning organic material.

**FIRE INCOMPATIBILITY**

■ Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result. Segregate from alcohol, water.

- NOTE: May develop pressure in containers; open carefully. Vent periodically.
- Keep dry.

**PERSONAL PROTECTION**

- Glasses:
- Chemical goggles.
- Gloves:
- Respirator:
- Particulate

**Section 6 - ACCIDENTAL RELEASE MEASURES**

**MINOR SPILLS**

- Material from spill may be contaminated with water resulting in generation of gas which subsequently may pressure closed containers.
- Hold spill material in vented containers only and plan for prompt disposal.
- Eliminate all ignition sources.
- Cover with DRY earth, sand or other non-combustible material.

**MAJOR SPILLS**

- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.

**Section 7 - HANDLING AND STORAGE**

**PROCEDURE FOR HANDLING**

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of overexposure occurs.

Empty containers may contain residual dust which has the potential to accumulate following settling. Such dusts may explode in the presence of an appropriate ignition source.

- Do NOT cut, drill, grind or weld such containers.
- In addition ensure such activity is not performed near full, partially empty or empty containers without appropriate workplace safety authorisation or permit.

**RECOMMENDED STORAGE METHODS**

■ Storage containers must be hermetically sealed; the product must be stored under an inert, dry gas.

For low viscosity materials and solids: Drums and jerricans must be of the non-removable head type. Where a can is to be used as an inner package, the can must have a screwed enclosure.

**STORAGE REQUIREMENTS**

■ KEEP DRY! Packages must be protected from water ingress.

FOR MINOR QUANTITIES:

- Store in an indoor fireproof cabinet or in a room of noncombustible construction and
- provide adequate portable fire-extinguishers in or near the storage area.

**Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION**

**EXPOSURE CONTROLS**

Source	Material	TWA ppm	TWA mg/m <sup>3</sup>	STEL ppm	STEL mg/m <sup>3</sup>	Peak ppm	Peak mg/m <sup>3</sup>	TWA F/CC	Notes
--------	----------	---------	-----------------------	----------	------------------------	----------	------------------------	----------	-------

US - California Permissible Exposure Limits for Chemical Contaminants	aluminium carbide (Aluminum welding fumes)		5		
US ACGIH Threshold Limit Values (TLV)	methane (Methane)	1000			TLV Basis: cardiac sensitization; central nervous system impairment
Canada - Prince Edward Island Occupational Exposure Limits	methane (Methane)	1000			TLV Basis: cardiac sensitization; central nervous system impairment
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	methane (Methane)		(See Table 12)		
Canada - Nova Scotia Occupational Exposure Limits	methane (Methane)	1000			TLV Basis: cardiac sensitization; central nervous system impairment
US - Oregon Permissible Exposure Limits (Z-1)	methane (Methane)	1,000	-		<b>Bold print identifies substances for which the Oregon Permissible Exposure Limits (PELs) are different than the federal Limits.</b>
Canada - Ontario Occupational Exposure Limits	methane (Alkane [C1 -C4], except Butane, All isomers / Alcane [C1 -C4], sauf le butane, tous les isomères)	1,000			
Canada - British Columbia Occupational Exposure Limits	methane (Diesel fuel, as total hydrocarbons, Inhalable)		100 (V)		Skin
Canada - British Columbia Occupational Exposure Limits	methane (Kerosene /Jet fuels, as total hydrocarbon vapour, Revised 2003)		200 (P)		Skin
Canada - Alberta Occupational Exposure Limits	methane (Kerosene/Jet fuels, as total hydrocarbon vapour)		200		
Canada - Saskatchewan Occupational Health and Safety Regulations -	methane (Diesel fuel as total hydrocarbons, (vapour))		100	150	Skin

Contamination Limits			
Canada - Alberta Occupational Exposure Limits	methane (Diesel fuel, as total hydrocarbons)	100	
Canada - British Columbia Occupational Exposure Limits	methane (Aliphatic hydrocarbon gases [C1-C4] Revised 2004)	1000	
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	methane (Aliphatic hydrocarbon gases, Alkane [C1-C4])	1000	1250

ENDOELTABLE

### PERSONAL PROTECTION



#### RESPIRATOR

- particulate.

#### EYE

- Safety glasses with side shields.
- Chemical goggles.

#### HANDS/FEET

- Wear chemical protective gloves, eg. PVC.

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).

- When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.
- When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended.
- Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

#### OTHER

- Overalls.
- Eyewash unit.
- Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are not recommended as they may produce static electricity.
- For large scale or continuous use wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets), non sparking safety footwear.

#### ENGINEERING CONTROLS

- Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.
- Exhaust ventilation should be designed to prevent accumulation and recirculation of particulates in the workplace.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### PHYSICAL PROPERTIES

Solid.

State	Divided solid	Molecular Weight	143.91
Melting Range (°F)	3812	Viscosity	Not available

Boiling Range (°F)	3992	Solubility in water (g/L)	Reacts
Flash Point (°F)	Not available	pH (1% solution)	Not available
Decomposition Temp (°F)	Not available	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not available	Vapour Pressure (mmHG)	Negligible
Upper Explosive Limit (%)	Not available	Specific Gravity (water=1)	2.36
Lower Explosive Limit (%)	Not available	Relative Vapor Density (air=1)	Not applicable
Volatile Component (%vol)	Negligible	Evaporation Rate	Not applicable

## APPEARANCE

Very hygroscopic hellow or green hexagonal crystals or powder; reacts with water. Soluble in dilute hydrochloric acid. Decomposes in dilute acid.

log Kow 1.09 Terrestrial fate An estimated Koc value of 90, determined from a log Kow of 1.09 indicates that methane is expected to have high mobility in soil Volatilisation is expected to be the most important fate process for methane in soil based on its vapor pressure of  $4.7 \times 10^5$  mm Hg at 25 deg C. Volatilisation of methane from moist soil surfaces is expected to be an important fate process given an estimated Henry's Law constant of 0.66 atm-cu m/mole derived from its vapor pressure, and water solubility, 22 mg/l. Utilisation of methane by soil microorganisms has been detected from five soil samples collected from sites near Adelaide, South Australia(6). Aquatic fate The estimated Koc value indicates that methane is not expected to adsorb to suspended solids and sediment. Volatilisation from water surfaces is expected to be the dominant fate process in aqueous systems based upon an estimated Henry's Law . Using this Henry's Law constant volatilisation half-lives for a model river and model lake are both 2 hrs. An estimated BCF of 1, derived from its log Kow suggests the potential for bioconcentration in aquatic organisms is low. The biodegradation half-life of methane was estimated to range from 70 days to infinity based on gas exchange biodegradation experiments conducted in model estuarine ecosystems.

Material	Value
----------	-------

## Section 10 - CHEMICAL STABILITY

### CONDITIONS CONTRIBUTING TO INSTABILITY

- May heat spontaneously
- Identify and remove sources of ignition and heating.

### STORAGE INCOMPATIBILITY

- Segregate from alcohol, water.
- Avoid reaction with oxidizing agents.
- NOTE: May develop pressure in containers; open carefully. Vent periodically.
- Avoid strong acids.
- Reacts violently with acids.
- Incandesces on heating with lead dioxide; potassium permanganate.
- For incompatible materials - refer to Section 7 - Handling and Storage.

## Section 11 - TOXICOLOGICAL INFORMATION

aluminium carbide

### TOXICITY AND IRRITATION

#### ALUMINIUM CARBIDE:

- unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.
- Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.

#### METHANE:

- No significant acute toxicological data identified in literature search.

### CARCINOGEN

methane	US - Rhode Island Hazardous Substance List	IARC
---------	--	------

### SKIN

methane	Canada - Alberta Occupational Exposure Limits - Skin	Substance Interaction	1
---------	--	-----------------------	---

## Section 12 - ECOLOGICAL INFORMATION

This material and its container must be disposed of as hazardous waste.

### Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
aluminium carbide	No Data Available	No Data Available		
methane	No Data Available	No Data Available	LOW	

## Section 13 - DISPOSAL CONSIDERATIONS

### US EPA Waste Number & Descriptions

A. General Product Information

Reactivity characteristic: use EPA hazardous waste number D003 (waste code R).

### Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

‡ Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.

- Recycle wherever possible.
- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.

## Section 14 - TRANSPORTATION INFORMATION

DOT:

Symbols: None Hazard class or Division: 4.3

Identification Numbers: UN1394 PG: II

Label Codes: 4.3 Special provisions: A20, IB7,

IP2, N41,

T3, TP33

Packaging: Exceptions: 151 Packaging: Non- bulk: 212

Packaging: Exceptions: 151 Quantity limitations: 15 kg

Passenger aircraft/rail:

Quantity Limitations: Cargo 50 kg Vessel stowage: Location: A

aircraft only:

Vessel stowage: Other: 52

Hazardous materials descriptions and proper shipping names:

Aluminum carbide

### Air Transport IATA:

ICAO/IATA Class: 4.3 ICAO/IATA Subrisk: None

UN/ID Number: 1394 Packing Group: II

Special provisions: None

Cargo Only

Packing Instructions: 50 kg Maximum Qty/Pack: 489

Passenger and Cargo Passenger and Cargo

Packing Instructions: 15 kg Maximum Qty/Pack: 484

Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity

Packing Instructions: 5 kg Maximum Qty/Pack: Y475

■ Air transport may be forbidden if this material is flammable, corrosive or toxic gases may be released under normal conditions of transport.

Shipping Name: ALUMINIUM CARBIDE

### Maritime Transport IMDG:

IMDG Class: 4.3 IMDG Subrisk: None

UN Number: 1394 Packing Group: II

EMS Number: F-G , S-N Special provisions: None

Limited Quantities: 500 g

Shipping Name: ALUMINIUM CARBIDE

## Section 15 - REGULATORY INFORMATION

**aluminium carbide (CAS: 12656-43-8,1299-86-1) is found on the following regulatory lists;**

"Canada Non-Domestic Substances List (NDSL)"

## Regulations for ingredients

### methane (CAS: 74-82-8) is found on the following regulatory lists;

"Canada - Nova Scotia Occupational Exposure Limits","Canada - Prince Edward Island Occupational Exposure Limits","Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)","Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances","Canada Domestic Substances List (DSL)","Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)","International Council of Chemical Associations (ICCA) - High Production Volume List","OECD Representative List of High Production Volume (HPV) Chemicals","US - California Permissible Exposure Limits for Chemical Contaminants","US - Massachusetts Oil & Hazardous Material List","US - Minnesota Hazardous Substance List","US - New Jersey Right to Know Hazardous Substances","US - Oregon Permissible Exposure Limits (Z-1)","US - Pennsylvania - Hazardous Substance List","US - Rhode Island Hazardous Substance List","US - Washington Permissible exposure limits of air contaminants","US ACGIH Threshold Limit Values (TLV)","US CERCLA Priority List of Hazardous Substances","US Department of Homeland Security Chemical Facility Anti-Terrorism Standards - Chemicals of Interest","US DOE Temporary Emergency Exposure Limits (TEELs)","US DOT Coast Guard Bulk Hazardous Materials - List of Flammable and Combustible Bulk Liquid Cargoes","US EPA High Production Volume Program Chemical List","US List of Lists - Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112(r) of the Clean Air Act","US NFPA 45 Fire Protection for Laboratories Using Chemicals - Flammability Characteristics of Common Compressed and Liquefied Gases","US Spacecraft Maximum Allowable Concentrations (SMACs) for Airborne Contaminants","US Toxic Substances Control Act (TSCA) - Inventory"

## Section 16 - OTHER INFORMATION

### Ingredients with multiple CAS Nos

Ingredient Name CAS aluminium carbide 12656-43-8, 1299-86-1

*Reasonable care has been taken in the preparation of this information, but the author makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The author makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use. For additional technical information please call our toxicology department on +800 CHEMCALL.*

■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:  
[www.chemwatch.net/references](http://www.chemwatch.net/references).

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

*This document is copyright. Apart from any fair dealing for the purposes of private study, research, review or criticism, as permitted under the Copyright Act, no part may be reproduced by any process without written permission from CHEMWATCH. TEL (+61 3) 9572 4700.*

Issue Date: Oct-14-2010

Print Date: Apr-26-2011