TECHNICAL DATA SHEET

Date of Issue: 2021/07/22

Calcium Hydride, Grade B

CAS-No.	7789-78-8
EC-No.	232-189-2
REACH No.	01-2120774384-47-0000
Molecular formula	CaH2
Product number	10000422, 10002018

APPLICATION

Calcium hydride is used primarily as a source of hydrogen, as a drying agent for liquids and gases, and as a reducing agent for metal oxides.

SPECIFICATION

Ca total	min. 92 %
H	min. 980 ml/g CaH2
Mg	max. 0.8 %
N	max. 0.2 %
Al	max. 0.01 %
Cl	max. 0.5 %
Fe	max. 0.01 %

METHOD OF ANALYSIS

Calcium complexometric, impurities by spectral analysis and special analytical procedures. Gas volumetric determination of hydrogen. Produces with water approx. 1,010 ml hydrogen per gram.

PHYSICAL PROPERTIES

Appearance	powder
Colour	white to grey
Decomposition temperature	>= 600 °C Method: OECD Test Guideline 102
Boiling point/boiling range	(Decomposes below the boiling point.)
Density	1.90 g/cm3 at 20 °C Method: OPPTS 830.7300
Water solubility	(Substance hydrolyses rapidly.)
Molecular weight	42.1 g/mol
Grain Size	approx. 1 - 20 mm, contains up to 15 % fines

HANDLING & STORAGE

Handling	Flammable solid. Contact with water liberates highly flammable gases! Calcium hydride decomposes partially and reversibly at temperatures above 600 °C. Calcium hydride is insoluble in most organic solvents. Upon direct contact with water Calcium hydroxide [Ca(OH)2] and pure hydrogen gas are produced in a violent reaction and self-ignition is possible. One kg of CaH2 liberates approx. 1 m3 of hydrogen. Avoid contact with water and with skin. Wear protective goggles and gloves and avoid formation of dust. In case of fire cover with dry sand, calcined soda or quicklime. Never use water, carbon dioxide, or halocarbon extinguisher. Should be handled with minimal exposure to humid air.
Storage	Store in airtight containers away from open flame.

TRANSPORT & PACKAGING

UN number 1404

ADR	Class: 4.3	PG: I	Label: 4.3
RID	Class: 4.3	PG: I	Label: 4.3
IMDG	Class: 4.3	PG: I	Label: 4.3
IATA_C	Class: 4.3	PG: I	Packing instruction (cargo aircraft): 487
IATA_P	Class: 4.3	PG: I	

Hazard pictograms

Signal word Danger

H&P Phrases See Safety Data Sheet

Labelling The labelling is according to EU-GHS classification ((EG) 1272/2008) and may vary in other countries. Please refer to the respective Safety Data Sheet for your country.

Packaging

GGVE, GGVS, RID, ADR, IMDG: HDPE-bottle wide neck, max. 5 kg ICAO: HDPE-bottle wide neck, max. 1 kg

OTHER INFORMATION

Further Related Documents Safety Data Sheet

Remarks

More Information about the Application Area of Calcium Hydride

Hydrogen Generation
Calcium hydride serves as a convenient source of clean, though wet, hydrogen, by reaction with water in simple, low cost, lightweight generators. One pound of calcium hydride yields 17 cubic feet of hydrogen at S.T.P. By reaction with water, calcium hydride generates twice the amount of hydrogen as expected from its empirical formula according to the following reaction: $CaH_2 + 2H_2O \rightarrow Ca(OH)_2 + 2H_2$
This property is most useful in energy storage applications.

Drying Agent
Calcium hydride dries gases and liquids by irreversible reaction with water according to the equation shown above. By this reaction, 7 kg of CaH_2 will remove 6 kg of water. Please keep in mind: 7 kg of CaH_2 generate approx. 7 m3 of hydrogen when mixed with two equivalents of water.

Typical Industrial Drying with Calcium Hydride

Phase	Method	Contact Temp. (Time)	Water (ppm)
Hydrogen			
Gas	Fixed Bed	60 °C (for 1 min.)	inital 100 ppm - final 1 ppm
Argon			
Gas	Fixed Bed	30 °C (for 1 min.)	initial 5000 ppm - final 1 ppm
Hydrocarbon			
Gas	Fixed Bed	30 °C (for 0.2 min.)	initial 40 ppm - final 1 ppm
Liquid	Fixed Bed	30 °C (for 30 min.)	initial 200 ppm - final 1 ppm
Ether			
Liquid	Stirred Tank	30 °C (for 240 min.)	initial 400 ppm - final 1 ppm

Because of potentially dangerous reactions, CaH_2 is not recommended for drying chlorinated or fluorinated carbon compounds.

Reducing Agent
At high temperatures, CaH_2 reduces refractory oxides to the metals.