## **TECHNICAL DATA SHEET**

Date of Issue: 2016/09/02

# Calcium Hydride, Grade K

CAS-No. 7789-78-8

EC-No. 232-189-2

Molecular Formula CaH<sub>2</sub>

Product Number 455110

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 %		
Н	min. 980 ml/g CaH2	min. 980 ml/g CaH2	
Mg	max. 0.8 %		
N	max. 0.2 %		
Al	max. 0.01 %		
CI	max. 0.5 %		
Fe	max. 0.01 %		

## METHOD OF ANALYSIS

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

## PHYSICAL PROPERTIES

Appearance powder

Color gray white

The information presented herein is believed to be accurate and reliable, but is presented without guarantee or responsibility on the part of Albemarle Corporation and its subsidiaries and affiliates. It is the responsibility of the user to comply with all applicable laws and regulations and to provide for a safe workplace. The user should consider any health or safety hazards or information contained herein only as a guide, and should take those precautions which are necessary or prudent to instruct employees and to develop work practice procedures in order to promote a safe work environment. Further, nothing contained herein shall be taken as an inducement or recommendation to manufacture or use any of the herein materials or processes in violation of existing or future patent.



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Melting point/ range 816.0 °C

Decomposition temperature

600°C

Density ca. 1.9 g/cm3 at 20.0 °C

Water solubility (Not applicable)

Molecular weight 42.10 g/mol

Grain Size approx. 0 - 2 mm

#### 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.

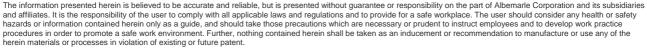
Should be handled with minimal exposure to humid air.

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		





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#### 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.

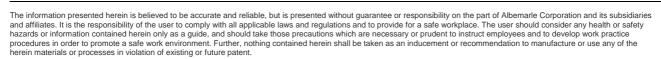
Packaging

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





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#### 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: CaH2 + 2H2O --> Ca(OH)2 + 2H2

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 CaH2 will remove 6 kg of water. Please keep in mind: 7 kg of CaH2 generate approx. 7 m3 of hydrogen when mixed with two equivalents of water.

## **Typical Industrial Drying with Calcium Hydride**

hase Met	hod C	Contact Temp. (Time)	Water (ppm)			
<b>lydrogen</b> Gas Fixe	ed Bed 6	60 °C (for 1 min.)	inital 100 ppm - final 1 ppm			
<b>irgon</b> Gas Fixe	ed Bed 3	30 °C (for 1 min.)	initial 5000 ppm - final 1 ppm			
Hydrocarbon						
		,				
iquid Fixe	ed Bed 3	30 °C (for 30 min.)	initial 200 ppm - final 1 ppm			
i <b>ther</b> iauid Stiri	ed Tank 3	30 °C (for 240 min.)	initial 400 ppm - final 1 ppm			
Argon Gas Fixe Hydrocarbo Gas Fixe iquid Fixe	ed Bed 3  on ed Bed 3 ed Bed 3	,				

Because of potentially dangerous reactions, CaH2 is not recommended for drying chlorinated or fluorinated carbon compounds.

#### **Reducing Agent**

At high temperatures, CaH2 reduces refractory oxides to the metals.

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