



Calcium hydride Grade B

Article Number 455120

CAS-No. 7789-78-8

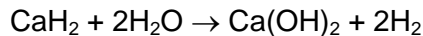
Typical Properties

Formula:	CaH ₂
Molecular Weight:	42.10 g/mol
Form and Color:	granules, grey
Melting Point:	decomposition above 1000°C
Density:	1.7 g/cm ³

Applications 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.

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:



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

Material	Phase	Method	Contact Temp.C°	Time Min.	Water (ppm)	
					Initial	Final
Hydrogen	Gas	Fixed Bed	60	1	100	1
Argon	Gas	Fixed Bed	30	1	5000	1
Hydrocarbon	Gas	Fixed Bed	30	0.2	40	1
Hydrocarbon	Liquid	Fixed Bed	30	30	200	1
Ether	Liquid	Stirred Tank	30	240	400	1

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

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Reducing Agent

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

Characteristics

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.

Particle Size

approx. 1 - 20 mm, contains up to 15 % fines

Typical

Analysis

Ca total	min. 92 %
H	min. 980 ml/g CaH ₂
Mg	max. 0.8 %
N	max. 0.2 %
Al	max. 0.01 %
Cl	max. 0.5 %
Fe	max. 0.01 %

Recommended Test Methods

Calcium gravimetrically, impurities by spectral analysis and special analytical procedures. Gas volumetric determination of hydrogen. Produces with water approx. 1010 ml of hydrogen per gram.

Handling

Avoid contact with water and with skin. Store in airtight containers away from open flame. 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.

Packaging

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

Transport

Classification

GGVE, GGVS, RID, ADR: class 4.3 UN-No. 1404, PG. I
IMDG-code: class 4.3 UN-No. 1404, PG. I
ICAO: class 4.3 UN-No. 1404, PG. I
Cargo Aircraft Only