## 19 Specific References


1 Todd RG, Wade A, eds. *The Pharmaceutical Codex*, 11th edn. London: Pharmaceutical Press, 1979; 125.
2 Lewis RJ, ed. *Sax's Dangerous Properties of Industrial Materials*, 12th edn. New York: Wiley, 2012; 824.
3 Donnelly WR. Exothermic composition and hot pack. United States Patent 4203418; 1980.
4 Wei X, *et al.* Sigmoidal release of indomethacin from pectin matrix tablets: effect of in situ crosslinking by calcium cations. *Int J Pharm* 2006; 318: 132–138.
5 Rege PR, *et al.* Chitinosan-drug complexes: effect of electrolyte on naproxen release in vitro. *Int J Pharm* 2003; 250: 259–272.
6 Joint Formulary Committee. *British National Formulary*, No. 55. London: British Medical Association and Royal Pharmaceutical Society of Great Britain, 2008.
7 *Food Chemicals Codex*. [online] Bethesda, MD: United States Pharmacopeia. http://publications.usp.org (accessed 31 March 2017).


## 20 General References


Wenninger JA, McEwen JD Jr, eds. *CTFA Cosmetic Ingredient Handbook*. Washington DC: CTFA, 1992.


## 21 Author

MA Pellett.

## 22 Date of Revision

4 May 2017.

# Calcium Hydroxide

## 1 Nonproprietary Names

BP: Calcium Hydroxide
JP: Calcium Hydroxide
PhEur: Calcium Hydroxide
USP–NF: Calcium Hydroxide

## 2 Synonyms

Calcii hydroxidum; calcium hydrate; E526; hydrated lime; slaked lime.

## 3 Chemical Name and CAS Registry Number

Calcium hydroxide [1305-62-0]

## 4 Empirical Formula and Molecular Weight

$Ca(OH)_2$ 74.1

## 5 Structural Formula

*See* Section 4.

## 6 Functional Category

Alkalizing agent.

## 7 Applications in Pharmaceutical Formulation or Technology

Calcium hydroxide is a strong alkali and is used as a pharmaceutical pH adjuster/buffer and antacid in topical medicinal ointments, creams, lotions, and suspensions, often as an aqueous solution (lime water).[1,2] It forms calcium soaps of fatty acids, which produce water-in-oil emulsions (calamine liniment).[3,4]

Calcium hydroxide is a common cosmetic ingredient in hair-straightening and hair-removal products, and in shaving preparations.[1]

## 8 Description

Calcium hydroxide occurs as a white or almost white, crystalline or granular powder. It has a bitter, alkaline taste. Calcium hydroxide readily absorbs carbon dioxide to form calcium carbonate.

## 9 Pharmacopeial Specifications

*See* Table I.

**Table I:** Pharmacopeial specifications for calcium hydroxide.

| Test | JP XVII | PhEur 9.2 | USP 40–NF 35 S1 |
|---|---|---|---|
| Identification | + | + | + |
| Acid-insoluble substances | ≤25 mg | ≤0.5% | ≤0.5% |
| Carbonates | — | ≤5.0% | + |
| Chlorides | — | ≤330 ppm | — |
| Sulfates | — | ≤0.4% | — |
| Heavy metals | ≤40 ppm | — | ≤20 µg/g |
| Arsenic | ≤4 ppm | ≤4 ppm | — |
| Magnesium and alkali (metals) salts | ≤24 mg | ≤4.0% | ≤4.8% |
| Assay | ≥90.0% | 95.0–100.5% | 95.0–100.5% |

## 10 Typical Properties

*Acidity/alkalinity* pH = 12.4 (saturated solution at 25°C)
*Density* 2.08–2.34 g/cm$^3$
*Melting point* When heated above 580°C, it dehydrates forming the oxide.
*Solubility* Soluble in glycerol and ammonium chloride solutions; dissolves in sucrose solutions to form calcium saccharosates;[2] soluble in acids with the evolution of heat; soluble 1 in 600 water (less soluble in hot water); insoluble in ethanol (95%).

## 11 Stability and Storage Conditions

Calcium hydroxide should be stored in an airtight container, in a cool, dry, well-ventilated place. Calcium hydroxide powder may be sterilized by heating for 1 hour at a temperature of at least 160°C.[2]

## 12 Incompatibilities

Incompatible with strong acids, maleic anhydride, phosphorus, nitroethane, nitromethane, nitroparaffins, and nitropropane. Calcium hydroxide can be corrosive to some metals.