

Calcium Acetate

1 Nonproprietary Names

BP: Calcium Acetate
PhEur: Calcium Acetate
USP-NF: Calcium Acetate

2 Synonyms

Acetate of lime; acetic acid, calcium salt; brown acetate; calcii acetas; calcium diacetate; E263; gray acetate; lime acetate; lime pyrolignite; vinegar salts.

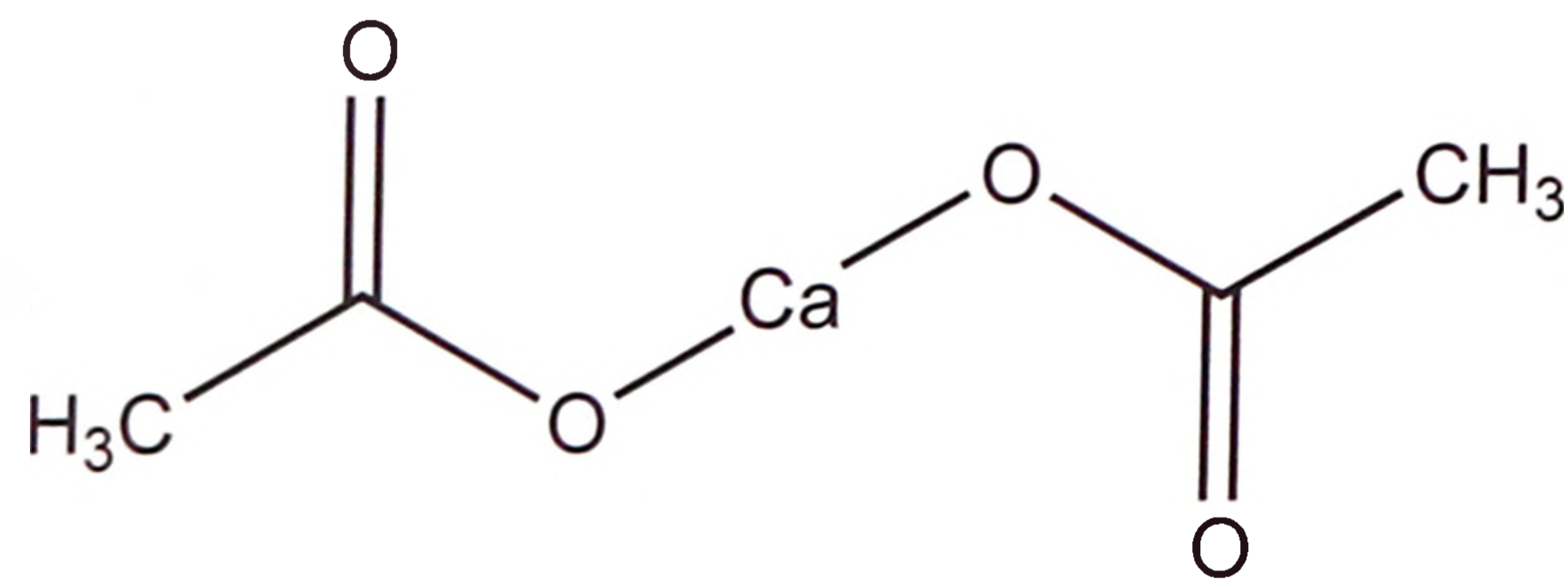
3 Chemical Name and CAS Registry Number

Calcium acetate [62-54-4]
Calcium acetate monohydrate [5743-26-0]

4 Empirical Formula and Molecular Weight

$C_4H_6CaO_4$ 158.18
 $C_4H_6CaO_4 \cdot H_2O$ 176.17 (for monohydrate)

5 Structural Formula



6 Functional Category

Antimicrobial preservative; complexing agent.

7 Applications in Pharmaceutical Formulation or Technology

Calcium acetate is used as a preservative in oral and topical formulations.

Calcium acetate is also used in the food industry as a stabilizer, buffer, and sequestrant.

8 Description

Calcium acetate occurs as a white or almost white, odorless or almost odorless, hygroscopic powder. Calcium acetate monohydrate occurs as needles, granules, or powder.

9 Pharmacopeial Specifications

See Table I.

10 Typical Properties

Acidity/alkalinity pH = 6.3–9.6 (5% solution); pH = 7.6 (0.2 M aqueous solution) for monohydrate

Density: 1.50 g/cm³

Solubility Soluble in water; slightly soluble in methanol; practically insoluble in acetone, ethanol (dehydrated alcohol), and benzene. The monohydrate is soluble in water, slightly soluble in alcohol.

Table I: Pharmacopeial specifications for calcium acetate.

Test	PhEur 9.2	USP 40-NF 35 S1
Identification	+	+
Readily oxidizable substances	+	+
pH	7.2–8.2	6.3–9.6
Nitrates	+	+
Chlorides	≤330 ppm	≤0.05%
Sulfates	≤600 ppm	≤0.06%
Heavy metals	—	≤25 ppm
Magnesium	≤500 ppm	≤0.05%
Arsenic	≤3 ppm	≤3 ppm
Aluminum	≤1 ppm	≤2 ppm
Barium	≤50 ppm	+
Potassium	≤500 ppm	≤0.05%
Sodium	≤500 ppm	≤0.5%
Strontium	≤500 ppm	≤0.05%
Water	≤7.0%	≤7.0%
Fluoride	≤50 ppm	≤50 ppm
Lead	—	≤10 ppm
Assay (anhydrous substance)	98.0–102.0%	99.0–100.5%

11 Stability and Storage Conditions

Calcium acetate is stable although very hygroscopic, and so the monohydrate is the common form. It decomposes on heating (above 160°C) to form calcium carbonate and acetone.

Store in well-closed airtight containers.

12 Incompatibilities

Calcium acetate is incompatible with strong oxidizing agents and moisture.⁽¹⁾

13 Method of Manufacture

Calcium acetate is manufactured by the reaction of calcium carbonate or calcium hydroxide with acetic acid or pyroligneous acid.⁽²⁾

14 Safety

Calcium acetate is used in oral and topical formulations. The pure form of calcium acetate is toxic by IP and IV routes.

LD₅₀ (mouse, IP): 0.075 g/kg⁽³⁾

LD₅₀ (mouse, IV): 0.052 g/kg⁽³⁾

LD₅₀ (rat, oral): 4.28 g/kg⁽¹⁾

15 Handling Precautions

Observe normal precautions appropriate to the circumstances and quantity of the material handled. Although regarded as safe during normal industrial handling, calcium acetate may cause eye and respiratory tract irritation.⁽¹⁾ It is combustible and when heated to decomposition, it emits acrid smoke and fumes. Avoid contact with eyes, skin, and clothing. Avoid breathing dust. Gloves, eye protection, respirator, and other protective clothing should be worn.