Potassium Benzoate

1 Nonproprietary Names

USPNF: Potassium benzoate

2 Synonyms

Benzoate of potash; benzoic acid potassium salt; E212; kalium benzoat; potassium salt trihydrate; *ProBenz PG*.

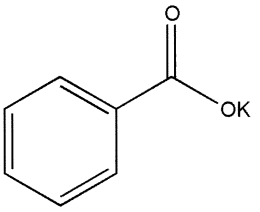
3 Chemical Name and CAS Registry Number

Potassium benzoate [582-25-2]

4 Empirical Formula and Molecular Weight

$C_7H_5KO_2$ 160.21

5 Structural Formula



6 Functional Category

Antimicrobial preservative; tablet and capsule lubricant.

7 Applications in Pharmaceutical Formulation or Technology

Potassium benzoate is predominantly used as an antimicrobial preservative in a wide range of beverages, foods and some pharmaceutical formulations. Preservative efficacy increases with decreasing pH; it is most effective at pH 4.5 or below. However, at low pH undissociated benzoic acid may produce a slight though discernible taste in food products.

Increasingly, potassium benzoate is used as an alternative to sodium benzoate in applications where a low sodium content is desirable.

Therapeutically, potassium benzoate has also been used in the management of hypokalemia. *See also* Table I.

Table I: Uses of potassium benzoate.

Use	Concentration (%)
Carbonated beverages	0.03–0.08
Food products	≤0.1

8 Description

Potassium benzoate occurs as a slightly hygroscopic, white, odorless or nearly odorless crystalline powder or granules. Aqueous solutions are slightly alkaline and have a sweetish astringent taste.

9 Pharmacopeial Specifications

See Table II.

Table II: Pharmacopeial specifications for potassium benzoate.

Test	USPNF 20
Identification	+
Alkalinity	+
Water	≤1.5%
Heavy metals	≤0.001%
Organic volatile impurities	+
Assay (anhydrous basis)	99.0–100.5%

10 Typical Properties

Acidity/alkalinity: aqueous solutions are slightly alkaline.
Boiling point: <300 °C
Solubility: *see* Table III.

Table III: Solubility of potassium benzoate.

Solvent	Solubility at 20 °C unless otherwise stated
Ethanol (95%)	1 in 75
Ethanol (90%)	1 in 50
Ether	Practically insoluble
Methanol	Very slightly soluble
Water	1 in 2.46 at 13 °C
	1 in 2.43 at 17.5 °C
	1 in 2.36
	1 in 2.27 at 33.3 °C
	1 in 2.23 at 41 °C
	1 in 2.15 at 50 °C

Specific gravity: 1.5

11 Stability and Storage Conditions

Potassium benzoate is stable at room temperature under normal storage conditions. Since it is slightly hygroscopic, potassium benzoate should be stored in sealed containers. Exposure to conditions of high humidity and elevated temperatures should be avoided.

12 Incompatibilities

Potassium benzoate is incompatible with strong acids and strong oxidizing agents.

13 Method of Manufacture

Potassium benzoate is prepared from the acid–base reaction between benzoic acid and potassium hydroxide.

14 Safety

Potassium benzoate is widely used in food products and is generally regarded as a nontoxic and nonirritant material. However, people with a history of allergies may show allergic reactions when exposed to potassium benzoate. Ingestion is inadvisable for asthmatics. Higher concentrations of potassium benzoate have been reported to cause irritation to mucous membranes.

The WHO acceptable daily intake of total benzoates including potassium benzoate, calculated as benzoic acid, has been estimated at up to 5 mg/kg of body-weight.[1,2]

15 Handling Precautions

Observe normal precautions appropriate to the circumstances and quantity of material handled. Potassium benzoate may be irritant to the eyes and skin. Eye protection and gloves are recommended. When exposed to heat, and when heated to decomposition, potassium benzoate emits acrid smoke and irritating fumes.

16 Regulatory Status

GRAS listed. Accepted as a food additive in Europe.

17 Related Substances

Benzoic acid; sodium benzoate.

18 Comments

The EINECS number for potassium benzoate is 209-481-3.

19 Specific References

1 FAO/WHO. Toxicological evaluation of certain food additives with a review of general principles and of specifications. Seventeenth report of the joint FAO/WHO expert committee on food additives. *World Health Organ Tech Rep Ser* 1974; No. 539.
2 FAO/WHO. Evaluation of certain food additives and contaminants. Twenty-seventh report of the joint FAO/WHO expert committee on food additives. *World Health Organ Tech Rep Ser* 1983; No. 696.

20 General References

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21 Author

SC Owen.

22 Date of Revision

10 June 2002.