

Dipotassium Phosphate (K_2HPO_4), FCC

Food-grade phosphate buffering agent for food processing, fermentation, culture media, and industrial formulation.

OVERVIEW

Dipotassium Phosphate (K_2HPO_4 , CAS 7758-11-4), FCC grade, is a high-purity, freely water-soluble inorganic phosphate salt supplied by AuSaMicS Pty Ltd as a buffering agent, stabiliser, and nutrient source. It is the dibasic salt of phosphoric acid, providing strong buffering capacity in the alkaline range and serving as an essential phosphate and potassium source in fermentation and culture media systems.

Manufactured and packed under quality-controlled conditions at AuSaMicS's Epping facility, with batch-specific Certificates of Analysis confirming compliance with FCC grade requirements.

KEY IDENTIFIERS

Catalogue Number	AS-8040
Chemical Name	Dipotassium hydrogen phosphate
CAS Number	7758-11-4
EINECS Number	231-834-5
Molecular Formula	K_2HPO_4
Molecular Weight	174.18 g/mol
HS Code	2835.24.00 — Phosphates of potassium
Grade	FCC (Food Chemicals Codex)

CHEMICAL IDENTITY & BUFFERING PARAMETERS

Parameter	Value
pK_{a2} ($H_2PO_4^- / HPO_4^{2-}$)	7.20 at 25°C
pK_{a3} (HPO_4^{2-} / PO_4^{3-})	12.35 at 25°C
Practical buffering range	pH 5.8 – 9.0 (mixed with monopotassium phosphate for pH 5.8–8.0)

TYPICAL SPECIFICATIONS (FCC GRADE)

Parameter	Specification	Method
Assay (as K_2HPO_4 , anhydrous)	≥ 98.0%	Titrimetric / ICP
Appearance	White crystalline powder or granules	Visual
pH (1% w/v solution, 25°C)	8.5 – 9.6	Potentiometric
Loss on drying (105°C, 1 hr)	≤ 2.0%	Gravimetric
Heavy metals (as Pb)	≤ 10 ppm	ICP-OES
Insoluble matter	≤ 0.2%	Gravimetric filtration

Chloride (as Cl ⁻)	≤ 200 ppm	Argentometric
Sulfate (as SO ₄ ²⁻)	≤ 300 ppm	Turbidimetric
Arsenic (as As)	≤ 3 ppm	ICP-OES
Fluoride (as F ⁻)	≤ 10 ppm	Ion-selective electrode

PHYSICAL & CHEMICAL PROPERTIES

Property	Value
Physical State	Solid, crystalline
Colour	White
Odour	Odourless
Melting Point	≈340°C (decomposes)
Water Solubility	Freely soluble
Ethanol Solubility	Practically insoluble
Storage Temperature	15 – 30°C, dry, sealed

MODE OF ACTION

In aqueous solution, K₂HPO₄ fully dissociates to K⁺ cations and HPO₄²⁻ anions. Buffering action operates via the HPO₄²⁻/H₂PO₄⁻ conjugate acid-base pair (pK_{a2} = 7.20), consuming added acid or base to resist pH change. In fermentation and culture media, phosphate is the primary inorganic phosphorus source for ATP, DNA, RNA, and phospholipid biosynthesis, while K⁺ is the dominant intracellular cation required for ribosome function and enzyme activation.

BUFFER PREPARATION REFERENCE

Buffer System	Components	pH Range	Common Use
Phosphate Buffer (PB)	K ₂ HPO ₄ + KH ₂ PO ₄	5.8 – 8.0	Biochemistry, cell culture, enzyme assays
Phosphate Buffered Saline (PBS)	K ₂ HPO ₄ + KH ₂ PO ₄ + NaCl + KCl	7.2 – 7.4	Cell biology, immunology, buffer washes
M9 Minimal Medium	K ₂ HPO ₄ + KH ₂ PO ₄ + NaCl + NH ₄ Cl	≈7.0	E. coli genetics, recombinant protein
Sørensen's Buffer	K ₂ HPO ₄ + KH ₂ PO ₄	5.4 – 8.2	Histology, staining protocols

APPLICATIONS

Sector	Application
Food & Beverage	pH buffering in processed foods; emulsifying salt in dairy; beverage stabilisation; mineral fortification
Fermentation & Biotechnology	Phosphate/potassium nutrient source in microbial fermentation and culture media (e.g. M9, MacConkey, MRS Broth)
Laboratory Use	Buffer preparation (PBS; phosphate buffer pH 7.4–9.0); process development; analytical chemistry
Industrial	Chemical formulations; water treatment; flame retardant formulations; textile processing

Not intended for pharmaceutical, therapeutic, injectable, or medical use unless separately qualified.

STORAGE & HANDLING

Storage Conditions	Store at 15–30°C in a cool, dry environment. Keep container tightly sealed — the product is hygroscopic at high relative humidity.
Shelf Life	Typically 3–5 years from manufacture under recommended storage conditions (refer to batch label/COA for specific expiry).
Handling	Avoid storage near strong acids or oxidising agents. Handle with standard laboratory/food-handling hygiene practices.

PACK SIZES

Pack Size	Recommended For
500 g	Laboratory and small-batch use
1 kg	Routine laboratory and food processing use
5 kg	Ongoing fermentation/production programmes
25 kg / Custom	Industrial and bulk supply — contact us for a quote

LITERATURE REFERENCES

1. Sambrook, J., & Russell, D.W. (2001). Molecular Cloning: A Laboratory Manual (3rd ed.). Cold Spring Harbor Laboratory Press.
2. Food Chemicals Codex (FCC), 13th Edition. US Pharmacopeia. Monograph: Dipotassium Phosphate.
3. Gomori, G. (1955). Preparation of buffers for use in enzyme studies. Methods in Enzymology, 1, 138–146.
4. Garrett, R.H., & Grisham, C.M. (2016). Biochemistry (6th ed.). Cengage Learning.

This document is issued by AuSaMicS Pty Ltd for laboratory, analytical and industrial use only. It is not intended for food, dietary supplement, therapeutic, diagnostic, cosmetic, or veterinary use unless explicitly stated. Information is provided in good faith based on data available at the time of issue and is believed to be accurate; however, AuSaMicS Pty Ltd makes no warranty, express or implied, regarding its completeness or applicability to any particular use. The user is responsible for determining the suitability of this product for their specific application and for compliance with all applicable laws and regulations. AuSaMicS Pty Ltd accepts no liability for loss or damage arising from reliance on this information.