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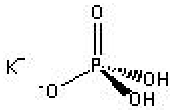
TECHNICAL INFORMATION

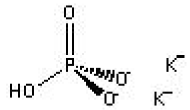
Catalog Number: 151945, 151946, 191430, 191431, 191432, 194727, 194845, 194846, 195453
Potassium phosphate dibasic and monobasic

Structure:

Monobasic



Dibasic



	Dibasic, anhydrous	***Dibasic, trihydrate***	***Monobasic, anhydrous***
Molecular Formula:	K_2HPO_4	$K_2HPO_4 \cdot 3H_2O$	KH_2PO_4
Molecular Weight:	174.18	228.2	136.09
CAS #	7758-11-4	16788-57-1	7778-77-0

Physical Description: White crystalline to granular powder; somewhat hygroscopic.
Synonyms:

Dibasic: Dipotassium phosphate; Dikalium phosphate; DKP; Dipotassium hydrogen phosphate
Monobasic: Potassium biphosphate; Potassium acid phosphate; Potassium dihydrogen phosphate; Monopotassium phosphate; Sorensen's potassium phosphate

Solubility: Soluble in water; Insoluble to slightly soluble in ethanol; insoluble in alcohol
Description: Potassium phosphate is a reagent with high buffering capacity. It occurs in several forms: monobasic, dibasic, and tribasic (K_3PO_4). Most pH neutral potassium phosphate buffer solutions consist of mixtures of the monobasic and dibasic forms to varying degrees, depending on the desired pH.
Typically used as a component for a wide variety of media used in the culture of microorganisms, as a component in phosphate buffered saline (PBS). In addition to helping maintain pH, it supplies essential phosphate.
Typical Buffer Preparation/Formulations:
Prepare the following solutions:

– 1 M Potassium Phosphate Monobasic
– 1 M Potassium Phosphate Dibasic
– 5 M Sodium Chloride

Formulation Guide:

	1 Liter of 0.05 M Phosphate Buffer (25°C)		**1 Liter of 0.05 M Phosphate Buffer with 0.15 M NaCl (25°C)**		
Desired pH	***1 M Monobasic Solution***	***1 M Dibasic Solution***	***1 M Monobasic Solution***	***1 M Dibasic Solution***	***5 M Sodium Chloride Solution***
6.6	32.0 ml	18.0 ml	26.6 ml	23.4 ml	30.0 ml
6.7	29.8 ml	20.2 ml	23.7 ml	26.3 ml	30.0 ml
6.8	26.5 ml	23.5 ml	20.9 ml	29.1 ml	30.0 ml

6.9	24.0 ml	26.0 ml	18.1 ml	31.9 ml	30.0 ml
7.0	21.1 ml	28.9 ml	15.6 ml	34.4 ml	30.0 ml
7.1	18.4 ml	31.6 ml	13.2 ml	36.8 ml	30.0 ml
7.2	16.8 ml	34.2 ml	11.1 ml	38.9 ml	30.0 ml
7.3	13.4 ml	36.6 ml	9.2 ml	40.8 ml	30.0 ml
7.4	11.2 ml	38.8 ml	7.6 ml	42.4 ml	30.0 ml
7.5	9.4 ml	40.6 ml	6.3 ml	43.7 ml	30.0 ml
7.6	7.8 ml	42.2 ml	5.1 ml	44.9 ml	30.0 ml

Add the specified amount to a volumetric flask and QS to 1 liter with distilled, deionized water.

The ratios above are specific for 50 mM buffers at the designated pH. Higher concentrations of phosphate or the presence of neutral salts will alter the pH. The volumes indicated on the right side of the table can be used as a guide in the preparation of 50 mM phosphate buffered saline (PBS). Sodium chloride lowers the pH approximately 0.01 pH unit for each 0.01 increase in molarity.[4]

For phosphate buffers, the pH increases with decreasing temperature. Compared with a buffer at 25°C, buffers at 4°C will be 0.08 pH unit higher and a buffer at 37°C will be 0.025 pH unit lower. The concentration of phosphate also influences pH. The dilution value for phosphate, defined as the change of pH of a buffer when diluted with an equivalent volume of water is 0.08.[5] Therefore, a 25 mM phosphate buffer prepared with half of the volumes indicated on the above table for a specific pH, would be approximately 0.08 pH units higher than the expected pH. Likewise, a 100 mM buffer prepared with double the volumes indicated would result in a pH approximately 0.08 pH units lower.

The pH values listed are only approximate. The pH should be measured prior to use and adjusted, if necessary.

Typical Phosphate Buffered Saline Formulations:

with calcium and magnesium:

Component	***mg/lt***	***Mol. (mM)***
Inorganic Salts		
Calcium Chloride [$CaCl_2$ $2H_2O$] Dihydrate	132.50000	0.90
Magnesium Chloride [$MgCl_2$ $6H_2O$] Hexahydrate	100.00000	0.49
Potassium Chloride [KCl]	200.00000	2.68
Potassium Phosphate Monobasic [KH_2PO_4]	200.00000	1.47
Sodium Chloride [NaCl]	8000.00000	136.89
Sodium Phosphate Dibasic [Na_2HPO_4]	1150.00000	8.10

without calcium and magnesium:

Components	***mg/liter***	***Mol. (mM)***
Inorganic Salts		
Potassium Chloride [KCl]	200.00	2.68
Potassium Phosphate Monobasic [KH_2PO_4]	200.00	1.47
Sodium Chloride [NaCl]	8000.00	136.89
Sodium Phosphate Dibasic [Na_2HPO_4]	1150.00	8.10

Availability:

Catalog Number	**Description**	**Size**

151945	Potassium phosphate dibasic, anhydrous	100 g 500 g 1 kg 5 kg
151946	Potassium phosphate dibasic, trihydrate	100 g 500 g 1 kg 10 kg
194845	Potassium phosphate dibasic, trihydrate, molecular biology reagent	100 g 500 g 1 kg
191431	Potassium phosphate dibasic, anhydrous, ACS Reagent Grade	100 g 500 g 1 kg 5 kg
191432	Potassium phosphate dibasic, trihydrate, reagent grade	100 g 500 g 1 kg 5 kg
194727	Potassium phosphate monobasic, anhydrous, cell culture reagent	100 g 500 g 1 kg
195453	Potassium phosphate monobasic, anhydrous	100 g 500 g 1 kg 10 kg
194846	Potassium phosphate monobasic, anhydrous, molecular biology reagent	100 g 500 g 1 kg
191430	Potassium phosphate monobasic, anhydrous, ACS Reagent Grade	100 g 500 g 1 kg 5 kg

Also Available:

Catalog Number	**Description**	**Size**
152575	Sodium Chloride, ACS Reagent Grade	500 g 1 kg 5 kg 10 kg
195088	Calcium Chloride, Dihydrate	500 g 1 kg 5 kg
191421	Magnesium Chloride, Hexahydrate, ACS Reagent Grade	100 g 500 g 1 kg 5 kg
191427	Potassium Chloride, ACS Reagent Grade	100 g 500 g 1 kg 5 kg
191440	Sodium phosphate dibasic, anhydrous, ACS Reagent Grade	100 g 500 g 1 kg 5 kg

References:

– *Merck Index*, **12th Ed.**, No. 7828 (dibasic)
– *Merck Index*, **12th Ed.**, No. 7829 (monobasic)
– *Molecular Cloning: A Laboratory Manual, 3rd Ed.*, Sambrook, J.F., et al. (eds.), Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, p. A1.5 (2001).
– Bates, R.G., *Determination of pH - theory and practice*, Wiley and Sons, New York (1964).
– Bates, R.G., "Revised Standard Values for pH Measurements from 0-95" *C.J. Res. Nat. Bur. Stds*. **66A**, 179-184 (1962).
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– Enfors, S.O., et al., "Combined use of extraction and genetic engineering for protein purification: recovery of beta-galactosidase fused proteins." *Bioseparation*, **v. 1(3-4)**, 305-310 (1990).
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solvents." *Meth. Enzymol.*, **v. 1**, 67-90 (1955).
– Pardue, K., and Williams, D., "Quantitative determination of non-ionic surfactants in protein samples, using ion-exchange guard columns." *Biotechniques*, **v. 14(4)**, 580-583 (1993).
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