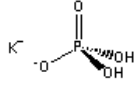


## Potassium phosphate dibasic and monobasic

### Structure:

#### Monobasic



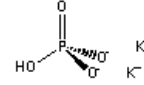
#### Dibasic, anhydrous



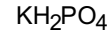
174.18

7758-11-4

#### Dibasic



#### Monobasic, anhydrous



136.09

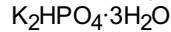
7778-77-0

Molecular Formula:

Molecular Weight:

CAS #

#### Dibasic, trihydrate



228.2

16788-57-1

**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 ( $\text{K}_3\text{PO}_4$ ). 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:

Desired pH	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)		
	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.<sup>4</sup>

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.<sup>5</sup> 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:

<b>Component</b>	<b>mg/lt</b>	<b>Mol. (mM)</b>
<b>Inorganic Salts</b>		
Calcium Chloride [CaCl <sub>2</sub> 2H <sub>2</sub> O] Dihydrate	132.50000	0.90
Magnesium Chloride [MgCl <sub>2</sub> 6H <sub>2</sub> O] Hexahydrate	100.00000	0.49
Potassium Chloride [KCl]	200.00000	2.68
Potassium Phosphate Monobasic [KH <sub>2</sub> PO <sub>4</sub> ]	200.00000	1.47
Sodium Chloride [NaCl]	8000.00000	136.89
Sodium Phosphate Dibasic [Na <sub>2</sub> HPO <sub>4</sub> ]	1150.00000	8.10

without calcium and magnesium:

<b>Components</b>	<b>mg/liter</b>	<b>Mol. (mM)</b>
<b>Inorganic Salts</b>		
Potassium Chloride [KCl]	200.00	2.68
Potassium Phosphate Monobasic [KH <sub>2</sub> PO <sub>4</sub> ]	200.00	1.47
Sodium Chloride [NaCl]	8000.00	136.89
Sodium Phosphate Dibasic [Na <sub>2</sub> HPO <sub>4</sub> ]	1150.00	8.10

#### Availability:

<b>Catalog Number</b>	<b>Description</b>	<b>Size</b>
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

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