phosphate buffer

Information from cshprotocols.org:
Gomori buffers, the most commonly used phosphate buffers, consist of a mixture of monobasic dihydrogen phosphate and dibasic monohydrogen phosphate. By varying the amount of each salt, a range of buffers can be prepared that buffer well between pH 5.8 and pH 8.0 (please see the tables below). Phosphates have a very high buffering capacity and are highly soluble in water. However, they have a number of potential disadvantages:

* Phosphates inhibit many enzymatic reactions and procedures that are the foundation of molecular cloning, including cleavage of DNA by many restriction enzymes, ligation of DNA, and bacterial transformation.

* Because phosphates precipitate in ethanol, it is not possible to precipitate DNA and RNA from buffers that contain significant quantities of phosphate ions.

* Phosphates sequester divalent cations such as Ca2+ and Mg2+.

0.5L of 1M K_2HPO_4 at 174.18g mol^{-1} = 87.09g
0.5L of 1M KH_2PO_4 at 136.09g mol^{-1} = 68.045g

preparation of 0.1 M potassium phosphate buffer at 25°C

Preparation of 0.1 M Potassium Phosphate Buffer at 25°C

pH	Volume of 1 M K_2HPO_4 (ml)	Volume of 1 M KH_2PO_4 (ml)
5.8	8.5	91.5
6.0	13.2	86.8
6.2	19.2	80.8
6.4	27.8	72.2
6.6	38.1	61.9
6.8	49.7	50.3
7.0	61.5	38.5
7.2	71.7	28.3
7.4	80.2	19.8
7.6	86.6	13.4
7.8	90.8	9.2
8.0	94.0	6.0

Dilute the combined 1 M stock solutions to 1 liter with distilled H_2O. pH is calculated according to the Henderson-Hasselbalch equation:

$$pH = pK' + \log \left\{ \frac{(\text{proton acceptor})}{\text{proton donor}} \right\}$$

where $pK' = 6.86$ at 25°C.