

Panel 1

Goal: Prepare a buffer with an initial pH of 6.85. The buffer must be able to consume 0.0010 moles of strong base with a maximum change in pH of 0.20 units. The following reagents are available to you:

Solutions: 6.0 M HCl, 6.0 M H_3PO_4 , 6.0 M CH_3COOH , 6 M NaOH

Solids: NaHCO_3 , $\text{Na}_3\text{PO}_4 \cdot 12\text{H}_2\text{O}$, Na_2CO_3 , Na_2HPO_4 , $\text{CH}_3\text{COONa} \cdot 3\text{H}_2\text{O}$

Which reagent(s) will you use and why?

1

Panel 2

How many grams of NaH_2PO_4 and Na_2HPO_4 are needed to make this buffer?

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Panel 3

The combined concentrations of HPO_4^{2-} and H_2PO_4^- must be greater than 0.010 M but less than 0.020 M. Given your answer to the previous problem, to what range of volumes can you add the Na_2HPO_4 and NaH_2PO_4 ?

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