

BUFFERS
Exit Ticket 12

1. Which of the following can be classified as a buffer solution? Give an explanation.

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| a) 0.25 M HBr + 0.25 M HOBr | Yes | No |
| b) 0.50 M HOCl + 0.35 M KOCl | Yes | No |
| c) 0.70 M KOH + 0.70 M HONH ₂ | Yes | No |
| d) 0.85 M H ₂ NNH ₂ + 0.60 M H ₂ NNH ₃ NO ₃ | Yes | No |

2. Calculate the pH of each of the following solutions:

- a) 0.100 M propanoic acid (HC₃H₅O₃; K_a = 1.3 × 10⁻⁵)
- b) 0.100 M sodium propanoate (NaC₃H₅O₃)
- c) A mixture containing 0.100 M HC₃H₅O₃ and 0.100 M NaC₃H₅O₃

3. Which of the following mixtures would result in buffered solution when 1.0 L of each of the two solutions are mixed? Explain your reasoning.
- a) 0.1 M KOH and 0.1 M $\text{CH}_3\text{NH}_3\text{Cl}$
 - b) 0.1 M KOH and 0.2 M CH_3NH_2
 - c) 0.2 M KOH and 0.1 M $\text{CH}_3\text{NH}_3\text{Cl}$
 - d) 0.1 M KOH and 0.2 M $\text{CH}_3\text{NH}_3\text{Cl}$
4. Calculate the pH of a buffered solution prepared by dissolving 21.5 g of benzoic acid ($\text{HC}_7\text{H}_5\text{O}_2$) and 37.7 g of sodium benzoate to 200.0 mL of solution. (K_a for benzoic acid = 6.4×10^{-5})
5. Calculate the mass of sodium acetate that must be added to 500.0 mL of 0.200 M acetic acid ($K_a = 1.8 \times 10^{-5}$) to form a pH 5.00 buffer solution.