International Medical School
Course of Chemistry and Introduction to Biochemistry
Academic Year 2016-2017

Buffer solutions

1. A solution of a weak acid HA with Ka=10^{-4} M is titrated with NaOH. After having added 0.05 equivalents of base, the measured pH is 4.0. Calculate the concentration of HA at the beginning.

2. Calculate the pH of the solution obtained by mixing 75ml of CH_3COOH 0.01 N with 50ml NaOH 0.01 M (Ka= $1.8\cdot10^{-5}$ M at 25°C).

3. 250ml of ethanoic acid 0.5 N are mixed with 250ml of NaOH 0.2 N. Calculate the pH of the final solution (Ka=$1.8\cdot10^{-5}$ M at 25°C).

4. 500 ml of HCN 0.2 N are mixed with 500ml of KOH 0.2 N. Calculate the pH of the final solution (Ka= $2\cdot10^{-4}$M).

5. Calculate the pH of a solution made by dissolving 0.6 g of acetic acid and 0.82 g of sodium acetate in 1L of water. Calculate the pH after having added 1ml of HCl 1M (Ka= $1.8\cdot10^{-5}$ M).

6. Calculate how many grams of KOH should be added to 400ml of weak acid HA 0.1 M (Ka=$3\cdot10^{-6}$ M) to obtain a solution at pH=5.3.

7. Calculate the pH of a solution made by dissolving 2.8 g of CH_2NH_2 and 5.0 g of CH_2NH_3Br in 500ml of water (Kb=$4.4\cdot10^{-4}$ M).

8. Which is the pH of a solution obtained after mixing 200 ml of KOH 0.1 M with 300ml of formic acid 0.15 M (Ka= $1.8\cdot10^{-4}$ M).