Buffer/Titration : Test-245

1) What is the purpose of doing a titration?

2) What is the equivalence point?

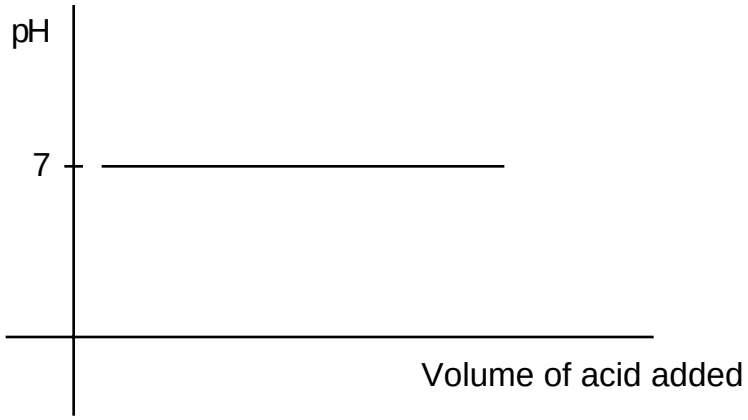
3) In a titration, 12.6 ml of a sodium hydroxide solution is neutralized by 17.2 ml of a 0.760 M sulfuric acid solution.

a) Write the balanced neutralization equation.

b) Find the concentration of the sodium hydroxide solution.

c) Write down the net ionic equation for this reaction.

4)a) Draw a picture of the titration curve for a weak base that is titrated with a strong acid. (acid added to base)



b) Name an indicator that can be used to find the equivalence point.

5) What is the color of the indicator methyl orange in these solutions.

a) 0.020 M HCl b) 0.00020 M HCl

6) A solution gives the following results with two indicators.

thymol blue	blue
alizarin yellow	yellow

Give the pH range of the solution.

7) Find the $[H_3O^+]$ of a solution with the indicator bromcresol green when the solution color is green.

8)a) What is hydrolysis?

b) State whether the following salts are acidic, basic, or neutral in solution.

i) KBr ii) Na_2SO_3 iii) NH_4F iv) $Fe(NO_3)_3$

9) Write down the hydrolysis reaction for the salt KNO_2.

10) State whether the following anhydrides are; acidic, basic, or amphiprotic.

a) MgO b) SnO_2 c) CO_2

11) The pH of pure water is 7.00. Find the new pH when 1.50 ml of 2.60 M HCl is added to 1.00 L of pure water.

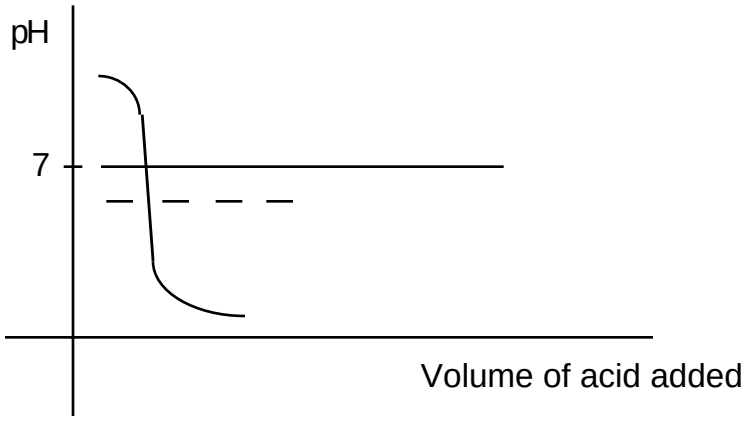
12)a) Write down the equilibrium reaction for the acetic acid-acetate ion buffer system.

b) A buffer is prepared by adding 0.200 mol of acetic acid and 0.100 mol of acetate ion to 1.00 liter of water. Find the pH.
($K_a = 1.74x10^{-5}$)

c) Find the new pH if 1.50 ml of 2.60 M HCl is added to 1.00 L of the above buffer system.

d) Find the new pH if 2.80 ml of 1.80 M NaOH is added to the buffer system prepared in part b).

Answers: 1) A titration is done to find the concentration of an unknown solution., 2) This occurs when $[OH^-] = [H_3O^+]$, 3)a) $2NaOH + H_2SO_4 \rightarrow 2H_2O + Na_2SO_4$, b) 2.07 M, c) $H_3O^+ + OH^- \rightarrow 2H_2O$, 4)a)



b) Any indicator where the color change occurs at a pH between 4.0 and 6.0. e.g. methyl red, 5)a) red, b) orange, 6) 9.6 - 10.1, 7) 2.5×10^{-5} M, 8)a) Hydrolysis is the reaction of a salt with water in which the water molecule is broken apart., b)i) N, ii) B, iii) A, iv) A, 9) $NO_2^- + H_2O <-> HNO_2 + OH^-$, 10)a) B, b) Amph, c) A, 11) 2.4, 12)a) $CH_3COOH + H_2O <-> H_3O^+ + CH_3COO^-$, b) 4.46, c) 4.43, d) 4.49.