

## Titrations Curves

1. The table below shows the results of tests performed on four 0.10 mol/L unknown solutions. One solution is NaOH(aq) and another is NaCl(aq). Determine which solution is NaOH(aq) and which is NaCl(aq). Justify your answer.

Solution	Conductivity of Solution	Colour with Bromothymol Blue
A	good	blue
B	good	yellow
C	good	green
D	poor	blue

---



---



---



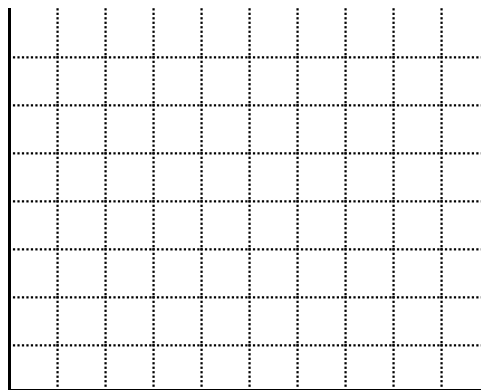
---



---

2. The table below shows three distinct colour changes observed using three different indicators during the titration of 25.0 mL of  $\text{H}_3\text{AsO}_4(\text{aq})$  with 0.10 M NaOH(aq).

Indicator	Colour Change
indigo carmine	blue to yellow
phenol red	yellow to red
thymolphthalein	colourless to blue



- (i) Sketch and label a titration curve for the complete titration.

- (ii) Write the balanced equation for the reaction that occurs when thymolphthalein changes colour.

- (iii) If the colour change associated with thymolphthalein occurred when 60.0 mL of NaOH(aq) was added, calculate the concentration of  $\text{H}_3\text{AsO}_4(\text{aq})$ . (0.120 mol/L)

3. What is the pH of a solution in which the indicators orange IV is yellow and methyl red is red?

4. The graph provided shows the titration of a 0.10 M unknown base with 0.10 M HCl.

a) What is a suitable indicator for this titration. Explain.

\_\_\_\_\_

\_\_\_\_\_

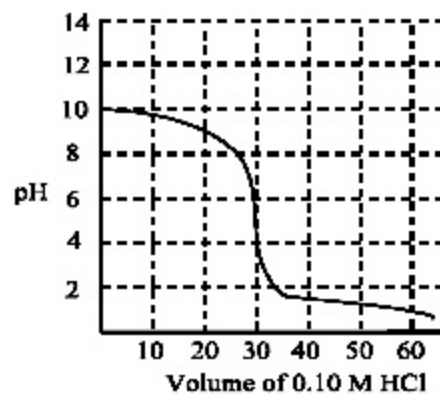
\_\_\_\_\_

b) Is the unknown base weak or strong? Explain.

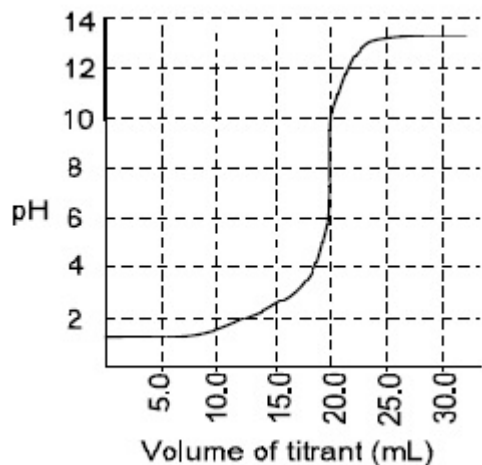
\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



5. A titration experiment was performed by adding 0.120 mol/L NaOH(aq) solution to 30.0 mL of an unknown monoprotic acid solution. Given the titration curve below, determine the concentration of the unknown acid. (0.0800 mol/L)



6. A 0.10 mol/L aqueous solution of a weak acid HA(aq), caused litmus to turn red and methyl orange to turn yellow. Calculate the percent reaction for HA(aq). (0.0355 %)