Titration Curve

Acid - Alkali titration

1. Strong acid - Strong base
2. Strong acid - weak base
3. weak acid - strong base
4. weak acid - weak base

Titration curves (pH curves)

- When an acid is added to a base, or a base to an acid, in a titration we can monitor and plot that changes in pH.

The resul is a titration curve.

In order to draw a titration curve the following have to be estimated.

- The pH at start.
- the pH at the equivalance spot.
- The volume of the acid/base from the burette required to reach the equivalance point.
- The pH range of the rear vertical range of the graph.
- The pH after excess reagent has been added from the burette (final pH)

Strong acid - Strong base

vertical range pH (3-11)

Strong acid - weak base

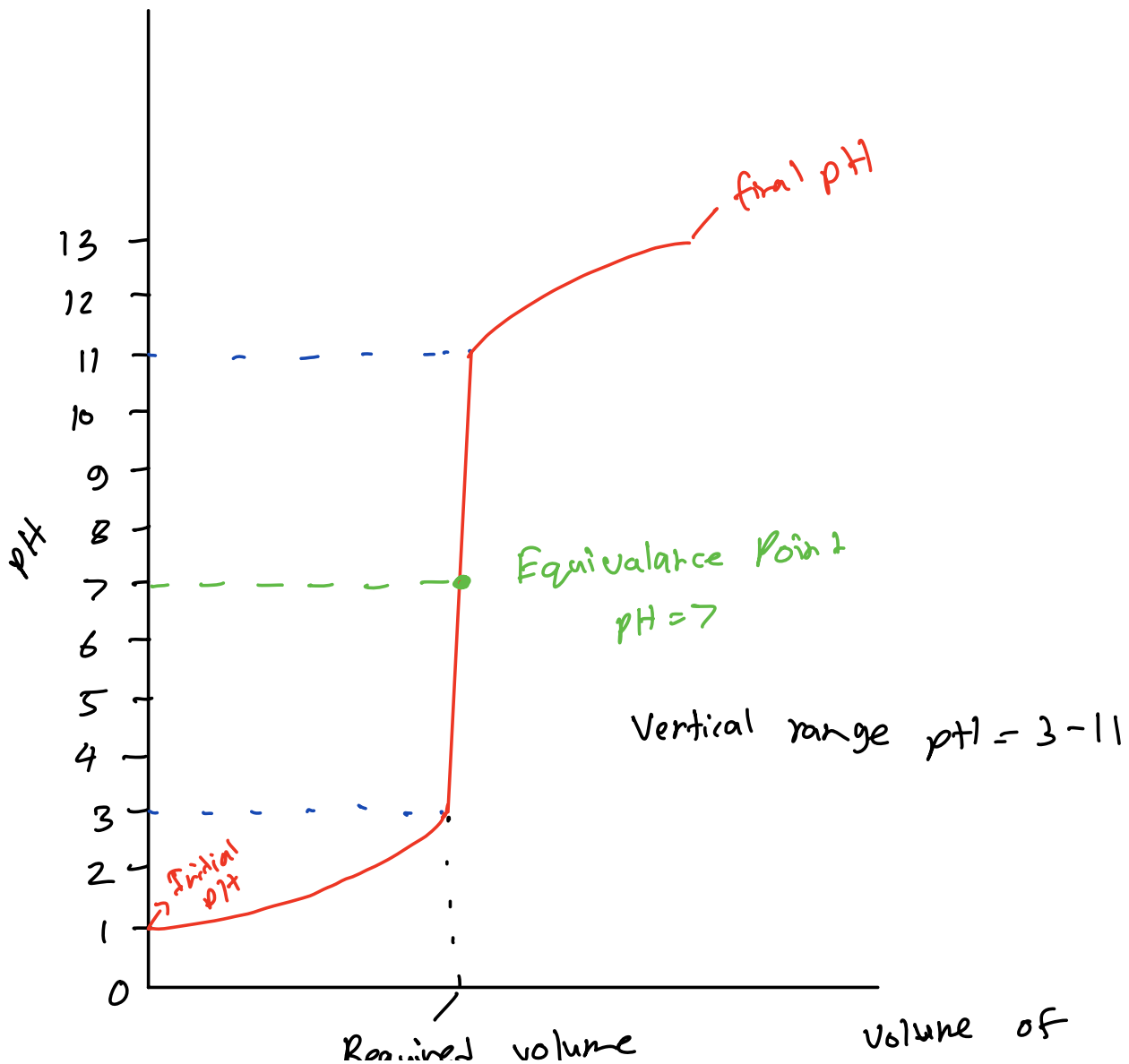
vertical range (3->)

weak acid – strong base

vertical range (7-11)

Strong acid with strong base

$$NaOH_{(aq)} + HCl_{(aq)} \rightarrow NaCl_{(aq)} + H_2O_{(l)}$$



of NaOH for the complete neutralisation.

NaOH (aq) added /cm³

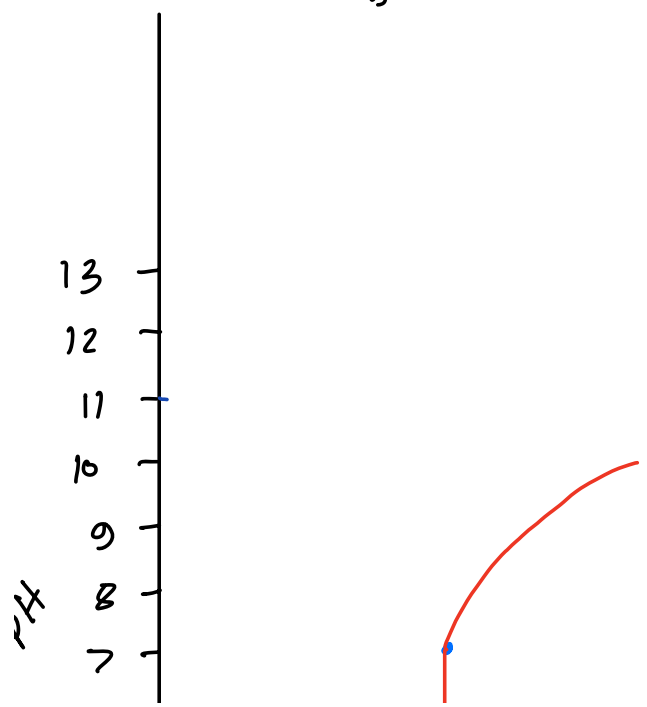
Suitable indicator

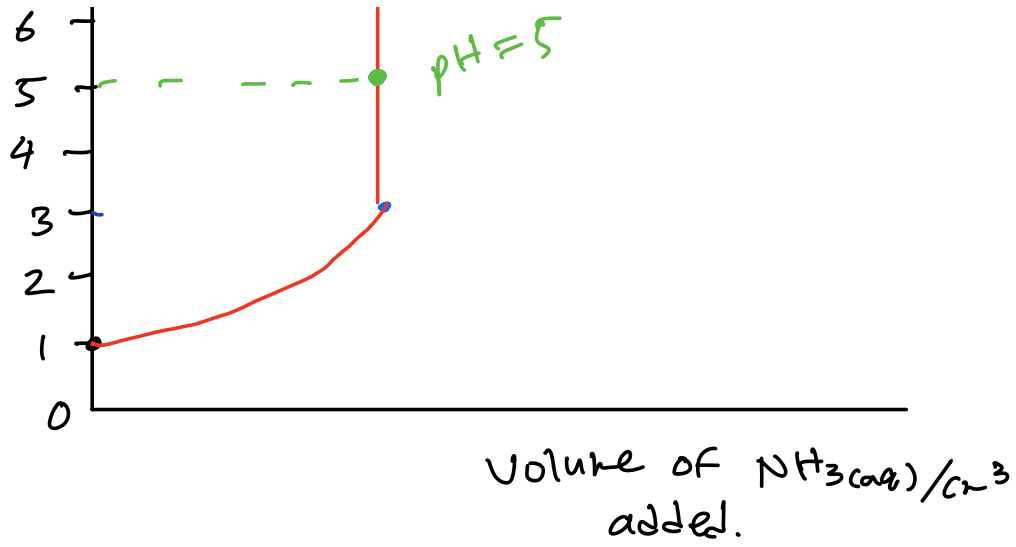
	pH range
Methyl orange	(3.2 – 4.4)
phenolphthalein	(8.2 – 10.0)

colorless pink

Strong acid - weak base titration

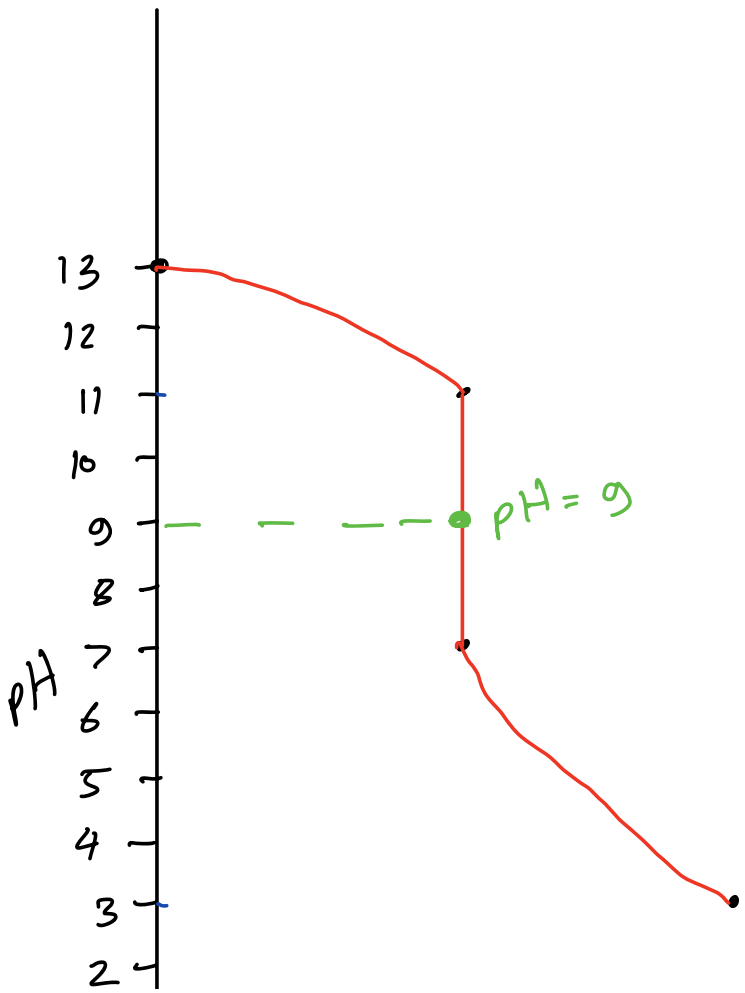
$$HCl_{(aq)} + NH_3\ (aq) \rightarrow NH_4Cl$$

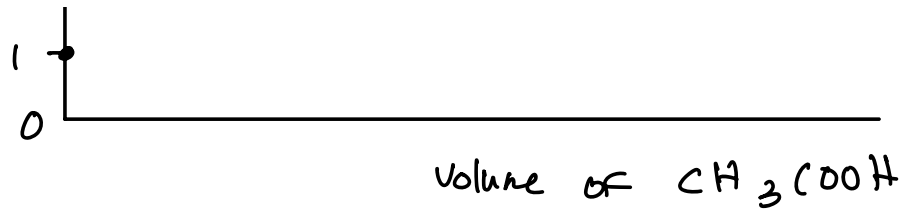




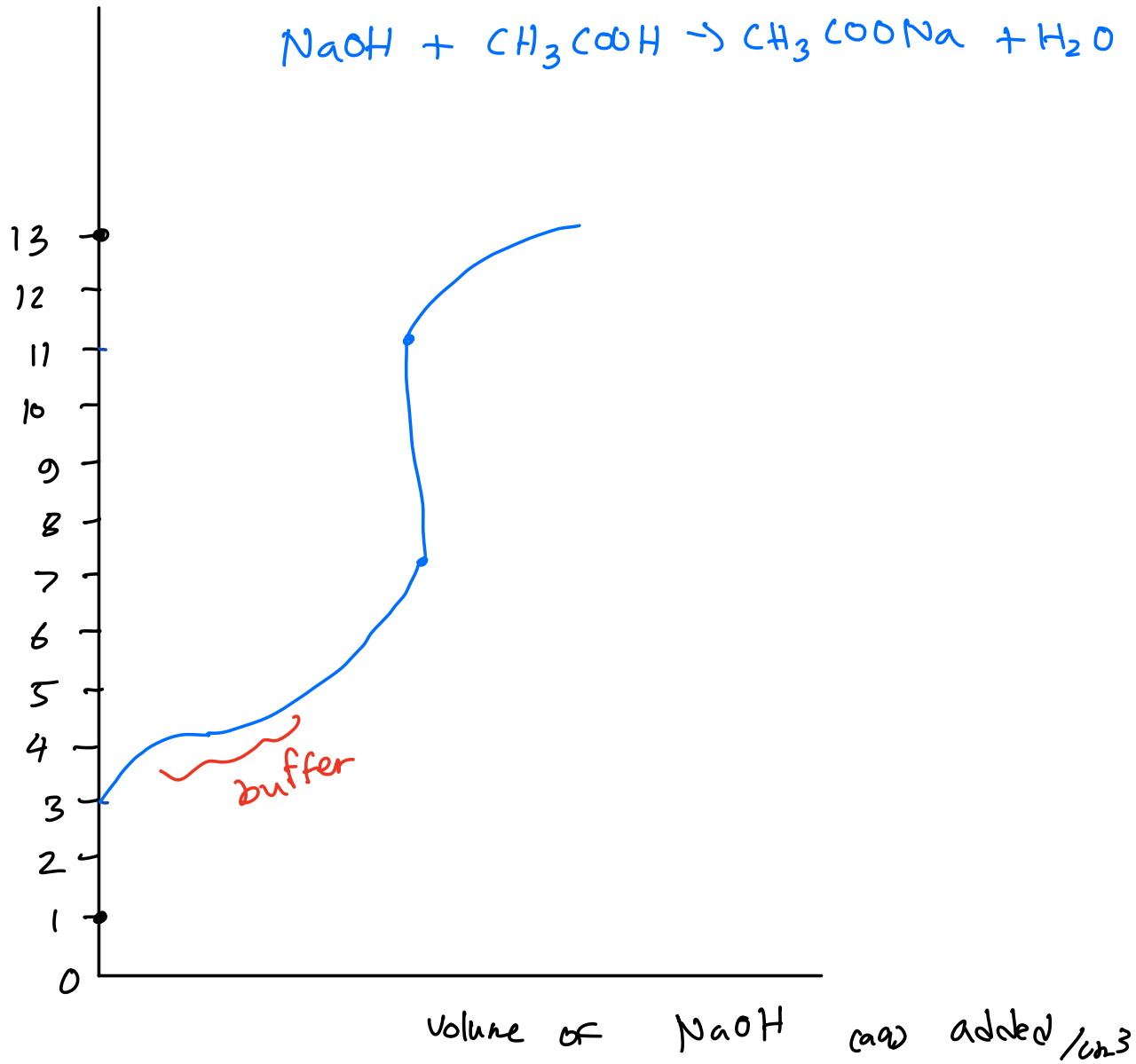
Strong base and weak acid

$$NaOH + CH_3COOH \rightarrow CH_3COONa + H_2O$$





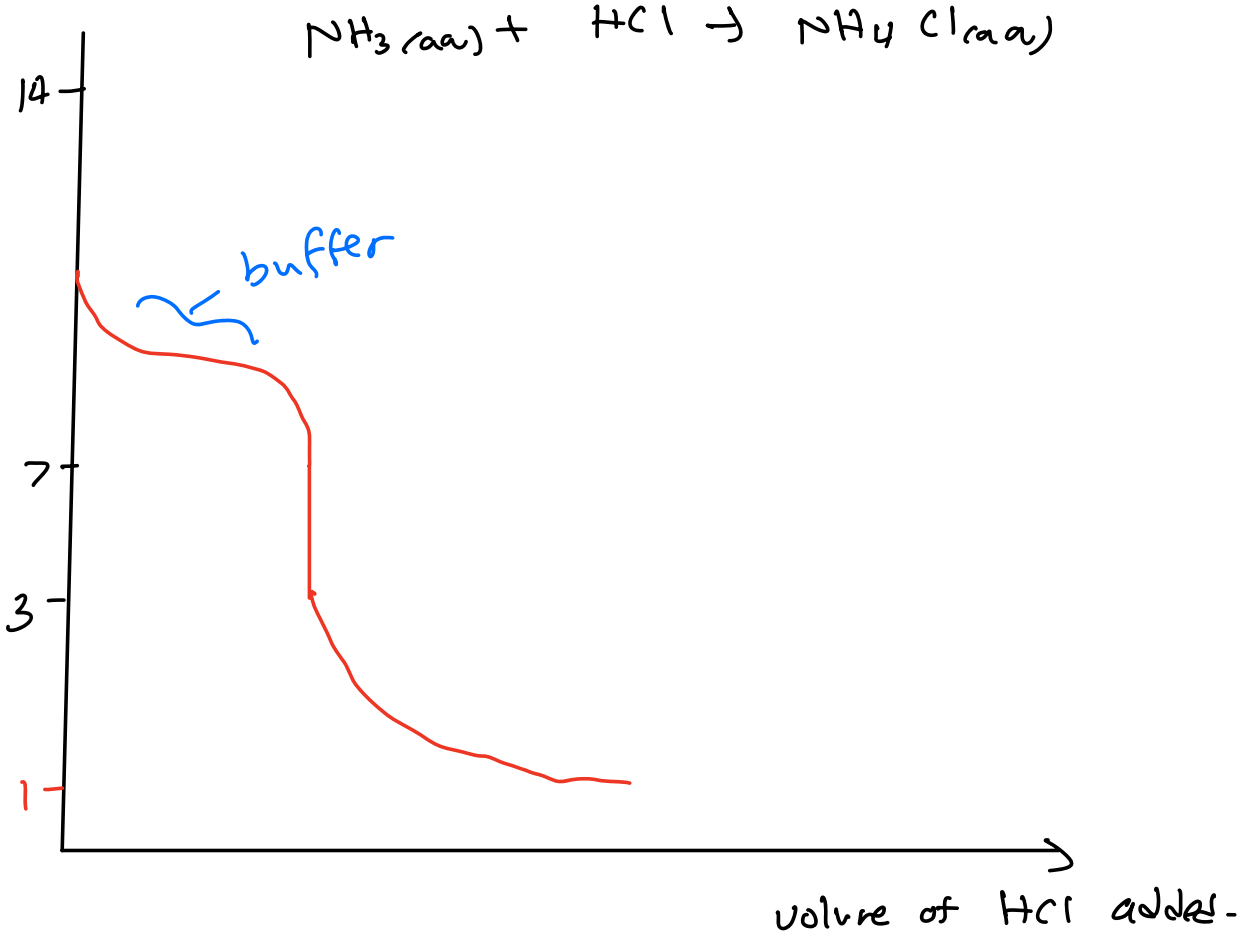
$NaOH + CH_3COOH \rightarrow CH_3COONa + H_2O$



Weak acid + its salt = buffer

weak base – strong acid

$NH_{3(aq)} + HCl \rightarrow NH_4Cl_{(aq)}$



weak base + its salt.