Chemistry: Chapter 19 Volumetric analysis involving acids and alkalis
Combined Science (Chemistry Part): Chapter 19 Volumetric analysis involving acids and alkalis

Sections 19.1−19.2
|!|EMA041919001O|!|
A standard solution is
A. a solution with highest concentration.
B. a solution with lowest concentration.
C. a solution with known concentration.
D. a solution with concentration of 1 mol $dm^{-3}$.

##C##

|!|EMA041919002O|!|
Which of the following is a correct procedure to prepare a standard solution starting with a pure solid?
A. Weigh the solid → Put into volumetric flask → Dissolve the solid → Add water to the mark of volumetric flask
B. Weigh the solid → Dissolve the solid → Put into volumetric flask → Add water to the mark of volumetric flask
C. Add water to the mark of volumetric flask → Weigh the solid → Dissolve the solid → Put into volumetric flask
D. Add water to the mark of volumetric flask → Weigh the solid → Put into volumetric flask → Dissolve the solid

##B##

|!|EMA041919003O|!|
Which of the following substances CANNOT be used to prepare a standard solution directly?
(1) Concentrated $H_2SO_4$
(2) Solid NaOH
(3) Liquid $NH_3$
A. (1) and (2) only
B. (1) and (3) only
C. (2) and (3) only
D. (1), (2) and (3)

##D Concentrated $H_2SO_4$ and solid NaOH absorb water from the atmosphere, this makes weighing inaccurate. Liquid $NH_3$ is volatile and irritating, this makes weighing inaccurate and difficult to handle.##

Section 19.3

|!|EMA041919004O|!|

In titrating 0.101 M sodium hydroxide solution with ~0.1 M hydrochloric acid, the conical flask containing the alkali has to be first washed with

A. water.
B. the alkali solution.
C. water and then the alkali solution.
D. the acid solution.

##A##

|!|EMA041919005O|!|

During a titration experiment, which of the following pieces of apparatus should be rinsed with the solution they would deliver (or hold)?

(1) Pipette
(2) Conical flask
(3) Burette

A. (1) and (2) only
B. (1) and (3) only
C. (2) and (3) only
D. (1), (2) and (3)

##B##

|!|EMA041919006O|!|

In a titration experiment, 25.0 $cm^3$ of dilute sodium hydroxide solution is titrated against a standard solution of sulphuric acid with phenolphthalein as an indicator. Which of the following statements concerning this experiment is/ are correct?

(1) The colour of phenolphthalein changes from colourless to pink at the end point.
(2) The colour of phenolphthalein changes from pink to colourless at the end point.
(3) The volume of the dilute sodium hydroxide is measured by a pipette.

A. (1) only
B. (2) only

C. (1) and (3) only
D. (2) and (3) only

☐

##D (1) is wrong because we add standard sulphuric acid from the burette into the conical flask containing sodium hydroxide and phenolphthalein. The mixture in the conical flask should be pink initially. Thus, (2) is correct. (3) is correct as transferring 25.0 $cm^3$ of reactant for titration, pipette is the most convenient tool with high accuracy.##

|!|EMA041919007O|!|
Which of the following apparatus can transfer 28.7 $cm^3$ of solution most accurately?
A. Measuring cylinder
B. Burette
C. Pipette
D. Conical flask

☐

##B A burette has a calibrated scale up to 0.1 $cm^3$ division.##

|!|EMA041919008O|!|
Which of the following apparatus should be cleaned with the solution to be held just before using it/ them?
(1) Burette
(2) Conical flask
(3) Pipette
A. (1) only
B. (2) only
C. (1) and (3) only
D. (2) and (3) only

☐

##C Water present inside burette and pipette will dilute the solution to be held.##

|!|EMA041919009O|!|
Which of the following is NOT very important for an accurate titration?
A. Burette reading
B. Pipette reading
C. End point detection
D. Volume of solution in conical flask

☐

##D##

|!|EMA041919010O|!|
Which of the following indicators can be used in the titration of HCl(aq) with $NH_3$(aq)?

A. Phenolphthalein
B. Methyl orange
C. Universal indicator
D. No suitable indicator

☐

##B##

|!|EMA041919011O|!|
In a titration experiment, 25.0 $cm^3$ of ammonia solution is titrated against a standard solution of hydrochloric acid with methyl orange as indicator. Which of the following colour change is correct at the end point?

A. Yellow to orange
B. Red to orange
C. Red to colourless
D. Colourless to orange

☐

##A Ammonia solution is initially in the conical flask, methyl orange shows yellow colour in an alkaline solution. Colour change from yellow to orange at the end point.##

|!|EMA041919012O|!|
Which of the following solutions would neutralize 50 $cm^3$ of 0.1 M $H_2SO_4$ completely when mixed?

A. 50 $cm^3$ of 0.1 M KOH
B. 100 $cm^3$ of 0.1 M NaOH
C. 50 $cm^3$ of 0.1 M $NH_3$
D. 100 $cm^3$ of 0.1 M $Ca(OH)_2$

☐

##B The equation of reaction is $H_2SO_4(aq) + 2NaOH(aq) \rightarrow Na_2SO_4(aq) + 2H_2O(l)$
Mole ratio of $H_2SO_4$ : NaOH = 1:2 . When equal concentration of $H_2SO_4$ and NaOH are used, the volume of NaOH used must be doubled so that the number of moles of NaOH is double that of $H_2SO_4$.##

|!|EMA041919013O|!|
Which of the following apparatus is usually used to deliver 25.0 $cm^3$ of a solution into a conical flask?

A. Burette
B. Pipette
C. Beaker
D. Volumetric flask

☐

##B##

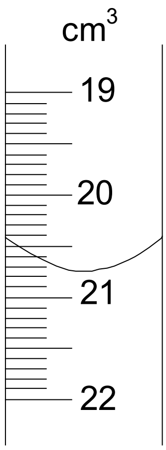
|!|EMA041919014O|!|
Which of the following is a correct procedure before filling the burette with dilute hydrochloric acid?

A. Wash the burette with hydrochloric acid only.
B. Wash the burette with distilled water only.
C. Wash the burette with distilled water and then hydrochloric acid.
D. Wash the burette with hydrochloric acid and then distilled water.

☐

##C##

|!|EMA041919015O|!|
What is the burette reading as shown in the diagram below?




A. 20.40
B. 20.60
C. 20.80
D. 21.20

☐

##C It is the bottom of the meniscus that gives the correct reading.##

|!|EMA041919016O|!|
Which of the following are correct procedures just before using a conical flask in titration?
(1) It is washed with the solution which is going to be delivered by the pipette.
(2) It is washed with the distilled water.
(3) A piece of white tile is placed under it during titration.
A. (1) and (2) only
B. (1) and (3) only
C. (2) and (3) only
D. (1), (2) and (3)

☐

##C Washing the conical flask with the solution it is to contain will increase the number of moles of solute in the titration, thus affecting the result of the titration.##

|!|EMA041919017O|!|
The following table shows the results of a titration. What is the average volume of acid added in this titration?

| **Titration** / **Burette reading** | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| **Final reading ($cm^3$)** | 24.6 | 26.1 | 25.4 | 26.6 |
| **Initial reading ($cm^3$)** | 1.1 | 1.4 | 0.6 | 2.1 |
| **Volume of acid added ($cm^3$)** | 23.5 | 24.7 | 24.8 | 24.5 |

A. 24.4 $cm^3$
B. 24.7 $cm^3$
C. 24.8 $cm^3$
D. 24.5 $cm^3$

☐

##B Titration 2, 3 and 4 should be used to calculate the average volume of acid added. The average is $\frac{24.7+24.8+24.5}{3}$ = 24.7 $cm^3$. The first titration result does not agree closely with the others, so just ignore it in the calculation.##

|!|EMA041919018O|!|
Which of the following apparatus should be used to deliver 25.0 $cm^3$ solution accurately from a volumetric flask to a conical flask?
(1) Pipette
(2) Burette

(3) Measuring cylinder

A. (1) only

B. (3) only

C. (1) and (2) only

D. (2) and (3) only

☐

##A##

|!|EMA041919019O|!|

Which of the following indicators are suitable for detection of the end point in the titration between 0.2 M HCl and 0.2 M NaOH?

(1) Methyl orange

(2) Phenolphthalein

(3) Universal indicator

A. (1) and (2) only

B. (1) and (3) only

C. (2) and (3) only

D. (1), (2) and (3)

☐

##A##

Section 19.4

|!|EMA041919020O|!|

The following were titration results for the reaction between 25.00 $cm^3$ of a sodium hydroxide solution and 0.100 M nitric acid:

| **Burette readings ($cm^3$)** | **1st** | **2nd** | **3rd** |
|---|---|---|---|
| Final reading | 32.50 | 32.40 | 33.20 |
| Initial reading | 1.00 | 2.50 | 3.10 |

The molarity of the sodium hydroxide solution would be

A. 0.126 M.

B. 0.124 M.

C. 0.122 M.

D. 0.120 M.

☐

##D##

|!|EMB041919021O|!|

If 25.0 $cm^3$ of 0.1 M potassium hydroxide solution is allowed to react with 25.0 $cm^3$ of 0.1 M sulphuric acid, the resultant product is

A. $K_2SO_4$.

B. $KHSO_4$.

C. $K_2SO_3$.

D. $KHSO_3$.

☐

##B##

|!|EMA041919022O|!|

Consider the following two solutions:

Solution *P*: 50 $cm^3$ of 0.05 M HCl

Solution *Q* 25 $cm^3$ of 0.1 M $CH_3COOH$

Which of the following statements about solutions *P* and *Q* is correct?

A. *P* reacts with Mg while *Q* does not.

B. *P* and *Q* require the same volume of 0.1 M NaOH for neutralization.

C. *P* can turn blue litmus paper red while *Q* cannot.

D. *P* reacts with sodium hydrogencarbonate while *Q* does not.

☐

##B Both *P* and *Q* are acidic solutions, they should have the same acidic properties. Although $CH_3COOH$ is a weak acid, 0.1 M NaOH can remove all the ionizable hydrogen from the weak acid.

No. of moles of $CH_3COOH$ is $0.1 \times \frac{25}{1000}$ = 0.025 mole; No. of moles of HCl = $0.05 \times \frac{50}{1000}$ = 0.025 mole; so they require the same no. of moles of NaOH to for neutralization.##

|!|EMA041919023O|!|

What volume of 0.25 mol $dm^{-3}$ sulphuric acid is required to neutralize 40.0 $cm^3$ of 0.2 mol $dm^{-3}$ sodium carbonate?

$Na_2CO_3 + H_2SO_4 \rightarrow Na_2SO_4 + H_2O + CO_2$

A. $\frac{0.25 \times 40}{0.2}$ $cm^3$

B. $\frac{0.25 \times 40 \times 2}{0.2}$ $cm^3$

C. $\frac{0.2 \times 40}{0.25}$ $cm^3$

D. $\dfrac{0.2 \times 40}{0.25 \times 2}$ cm$^3$

☐

##C The mole ratio of $Na_2CO_3$ to $H_2SO_4$ = 1:1

So, $\dfrac{M_1V_1}{M_2V_2} = \dfrac{1}{1}$

$M_1V_1 = M_2V_2$

$V_1 = \dfrac{0.2 \times 40}{0.25}$ cm$^3$

Where $M_1$ and $V_1$, $M_2$ and $V_2$ are the molarities and volumes of acid and carbonate respectively.##

|!|EMA0419190240|!|

The concentration of an aqueous solution of an acid is 2.0 M. 20.0 cm$^3$ of this acid solution requires 80.0 cm$^3$ of 1.0 M sodium hydroxide solution for complete neutralization. What is the basicity of the acid?

A. 1
B. 2
C. 3
D. 4

☐

##B Let $x$ be the basicity of the acid.

$H_xY + xNaOH \rightarrow Na_xY + xH_2O$

The mole ratio of the acid to NaOH = 1:$x$

No. of moles of NaOH used = 1.0 × $\dfrac{80}{1000}$ mol = 0.08 mol

So, the no. of moles of $H_xY$ = $\dfrac{0.08}{x}$

Molarity = $\dfrac{\text{no. of moles}}{\text{volume in dm}^3}$

So, 2.0 = $\dfrac{\left(\dfrac{0.08}{x}\right)}{\left(\dfrac{20}{1000}\right)}$

$\dfrac{0.08}{x} = \dfrac{40}{1000}$

$x$ = 2##

|!|EMB041919025O|!|

In an experiment, 2.0 M sodium hydroxide solution was added to 20.0 $cm^3$ of 1.0 M sulphuric acid until the acid was completely neutralized. What is the concentration of sodium sulphate (correct to two decimal places) in the resultant solution?

A. 0.25 M
B. 0.33 M
C. 0.50 M
D. 1.00 M

☐

##C $2NaOH + H_2SO_4 \rightarrow Na_2SO_4 + 2H_2O$

Mole ratio of NaOH to $H_2SO_4$ to $Na_2SO_4$ = 2:1:1

No. of moles of $H_2SO_4 = \frac{20.0}{1000} \times 1.0$ mol = 0.02 mol

i.e. No. of moles of NaOH used = 0.02 × 2 = 0.04 mol

Let $x$ be the volume of NaOH used in $dm^3$.

$$\text{Molarity} = \frac{\text{no. of moles}}{\text{volume in dm}^3}$$

$$2.0 = \frac{0.04}{x}$$

$x = 0.02$

The total volume of resultant solution = (0.02 + 0.02) $dm^3$ = 0.04 $dm^3$

No. of moles of $Na_2SO_4$ formed = 0.02 mol

The concentration of $Na_2SO_4 = \frac{0.02}{0.04}$ = 0.50 M##

|!|EMB041919026O|!|

The formula of a solid tribasic acid is $H_3X$. 3.89 g of the acid is dissolved in 250.0$cm^3$ of distilled water. 25.0 $cm^3$ of the dilute solution requires 18.0 $cm^3$ of 0.50 M sodium hydroxide solution for complete neutralization. What is the molar mass of $H_3X$? (correct to the nearest gram)

A. 100 g
B. 110 g
C. 120 g
D. 130 g

☐

##D $H_3X + 3NaOH \rightarrow Na_3X + 3H_2O$

Mole ratio of $H_3X$ to NaOH = 1:3

No. of moles of NaOH used = $\frac{18.0}{1000} \times 0.500$ mol = 0.009 mol

No. of moles of $H_3X$ in 25.0 cm$^3$ of diluted solution = $\frac{0.009}{3}$ mol = 0.003 mol

No. of moles of $H_3X$ in 250.0 cm$^3$ of diluted solution = 0.03 mol

Molar mass = $\frac{\text{Mass}}{\text{No. of moles}}$

Molar mass of $H_3X$ = $\frac{3.89}{0.03}$ g = 129.7 g = 130 g mol$^{-1}$ (to nearest gram)##

|!|EMB041919027O|!|

The formula of a metal carbonate is $X_2CO_3$. 50 cm$^3$ of a solution containing 0.53 g of the carbonate requires 25 cm$^3$ of 0.2 M sulphuric acid for complete neutralization. What is the relative atomic mass of metal $X$?

A. 19.0
B. 21.0
C. 23.0
D. 25.0

##C $X_2CO_3 + H_2SO_4 \rightarrow X_2SO_4 + H_2O + CO_2$

Mole ratio of $X_2CO_3$ to $H_2SO_4$ = 1:1

No. of moles of $H_2SO_4$ used = $\frac{25}{1000} \times 0.2$ mol = 0.005 mol

So, no. of moles of $X_2CO_3$ = 0.005 mol

Molar mass of $X_2CO_3$ = $\frac{0.53}{0.005}$ g mol$^{-1}$ = 106 g mol$^{-1}$

Let $y$ be the relative atomic mass of metal $X$.

$2y + 12.0 + 16.0 \times 3 = 106$

$2y = 46$

$y = 23$##

|!|EMA041919028O|!|

Different volumes of 1.0 M sodium hydroxide solutions and 1.0 M of hydrochloric acid are mixed in a polystyrene cup. In which of the following combinations would the temperature rise be the greatest?

| | Volume of 1.0 M NaOH(aq)/ cm$^3$ | Volume of 1.0 M HCl(aq)/ cm$^3$ |
|---|---|---|
| A. | 20 | 100 |

| | | |
|---|---|---|
| B. | 40 | 80 |
| C. | 60 | 60 |
| D. | 80 | 40 |

☐

##C NaOH + HCl → NaCl + $H_2O$
The mole ratio of NaOH to HCl = 1:1
As the acid and the alkali have the same concentration, they completely neutralize each other at the volume ratio of 1:1. At this volume ratio, no heat released from the reaction has been used to heat up the unreacted reactants. Hence, the temperature rise would be the greatest. Also, the no. of moles of $H^+$(aq) neutralizing $OH^-$(aq) is the greatest and thus the greatest amount of heat is given out.##

|!|EMA041919029O|!|
0.57 g of a sample of hydrated sodium carbonate $Na_2CO_3 \cdot nH_2O$ required 20.0 cm$^3$ of 0.20 M hydrochloric acid for complete neutralization. What is the number of crystallization, n, in the formula?

A. 1
B. 5
C. 9
D. 10

☐

##D $Na_2CO_3 \cdot nH_2O(s) + 2HCl(aq) \rightarrow 2NaCl(aq) + CO_2(g) + (n+1)H_2O(l)$
Molar mass of $Na_2CO_3 \cdot nH_2O$ = (106.0 + 18n) g mol$^{-1}$

Number of moles of HCl in 20.0 cm$^3$ of 0.20 M HCl(aq) = $0.20 \times \frac{20.0}{1000}$ mol
$= 4 \times 10^{-3}$ mol

Mole ratio of $Na_2CO_3 \cdot nH_2O$ : HCl = 1:2

So, number of moles of $Na_2CO_3 \cdot nH_2O$ used = $\frac{4 \times 10^{-3}}{2}$ mol = $2 \times 10^{-3}$ mol

$$\frac{0.57}{106.0 + 18n} = 2 \times 10^{-3}$$

So, n = 10##

|!|EMA041919030O|!|
1.05 g of a mixture of anhydrous sodium carbonate and sodium chloride was dissolved in 50 cm$^3$ of deionized water. The resultant solution required 28.5 cm$^3$ of 0.15 M sulphuric acid for complete reaction. What is the percentage purity of the anhydrous sodium carbonate sample?

A. 21.4 %
B. 43.8 %
C. 64.3 %
D. 85.6 %

☐

##B $Na_2CO_3(aq) + H_2SO_4(aq) \rightarrow Na_2SO_4(aq) + CO_2(g) + H_2O(l)$

Number of moles of sulphuric acid used to react with $Na_2CO_3 = 0.15 \times \frac{28.5}{1000}$ mol = $4.3 \times 10^{-3}$ mol

From the equation, mole ratio of $Na_2CO_3 : H_2SO_4 = 1:1$

Number of moles of $Na_2CO_3$ in the mixture = $4.3 \times 10^{-3}$ mol

Molar mass of $Na_2CO_3$ = 106.0 g mol$^{-1}$

Mass of $Na_2CO_3$ in the mixture = $4.3 \times 10^{-3} \times 106.0$ g = 0.46 g

% purity of $Na_2CO_3$ in the mixture = $\frac{0.46}{1.05} \times 100\%$ = 43.8%##

|!|EMA041919031O|!|

8.5 g of sodium carbonate can neutralize 25.0 cm$^3$ of 1 M sulphuric acid. What is the mass of carbon dioxide liberated at room temperature and pressure?

A. 1.1 g
B. 1.8 g
C. 3.5 g
D. 4.5 g

☐

##A $Na_2CO_3 + H_2SO_4 \rightarrow Na_2SO_4 + H_2O + CO_2$

Mole ratio of $Na_2CO_3$ to $H_2SO_4$ to $CO_2$ = 1:1:1

No. of moles of $Na_2CO_3$ used = $\frac{8.5}{23.0 \times 2 + 12.0 + 16.0 \times 3}$ mol = 0.08 mol

No. of moles of $H_2SO_4$ used = $\frac{25.0}{1000} \times 1$ mol = 0.025 mol

So, $H_2SO_4$ is the limiting reactant.

No. of moles $CO_2$ produced = 0.025 mol

Mass of $CO_2$ produced = $0.025 \times 44$ g = 1.1 g##

|!|EMA041919032O|!|

What mass of magnesium will react completely with 25.0 cm$^3$ of 0.20 M hydrochloric acid?

A. 0.06 g

B. 0.12 g
C. 0.18 g
D. 0.24 g

☐

##A Mg(s) + 2HCl(aq) → $MgCl_2$(aq) + $H_2$(g)

Number of moles of HCl used = $0.20 \times \frac{25.0}{1000}$ mol = $5 \times 10^{-3}$ mol

Mole ratio of Mg : HCl = 1:2

So, number of moles of magnesium needed = $\frac{5\times10^{-3}}{2}$ mol = $2.5 \times 10^{-3}$ mol

Molar mass of Mg = 24.3 g $mol^{-1}$

So, mass of Mg needed = $2.5 \times 10^{-3} \times 24.3$ g = 0.06 g##

|!|EMA041919033O|!|

3.65 g of HCl(g) is dissolved in 100 $cm^3$ of distilled water. What volume of 0.2 M NaOH can neutralize the resultant solution?

A. 250 $cm^3$
B. 500 $cm^3$
C. 750 $cm^3$
D. 1000 $cm^3$

☐

##B NaOH(aq) + HCl(aq) → NaCl(aq) + $H_2O$(l)

Number of moles of HCl present = $\frac{3.65}{1+35.5}$ mol = 0.100 mol

Mole ratio of NaOH : HCl = 1:1

So, number of moles of NaOH needed = 0.100 mol

Volume of solution = $\frac{0.100}{0.2}$ $dm^3$ = 0.5 $dm^3$ = 500 $cm^3$##

|!|EMA041919034O|!|

25.0 $cm^3$ of 0.20 M sulphuric acid is completely neutralized by 15.5 $cm^3$ of sodium hydroxide solution. What is the resultant concentration of the sodium sulphate solution formed?

A. 0.645 M
B. 0.323 M
C. 0.247 M
D. 0.123 M

☐

##D

$H_2SO_4(aq) + 2NaOH(aq) \rightarrow Na_2SO_4(aq) + 2H_2O(l)$

25.0 cm$^3$ 15.5 cm$^3$

0.20 M

Number of moles of $H_2SO_4$ used = $0.20 \times \frac{25.0}{1000}$ mol = $5.0 \times 10^{-3}$ mol

From the equation, mole ratio of $H_2SO_4 : Na_2SO_4 = 1 : 1$

Number of moles of $Na_2SO_4$ formed = $5.0 \times 10^{-3}$ mol

Volume of the reaction mixture = (25.0 + 15.5) cm$^3$ = 40.5 cm$^3$

$\therefore$ the concentration of $Na_2SO_4$ solution formed = $\frac{5.0 \times 10^{-3}}{\left(\frac{40.5}{1000}\right)}$ M

$= 0.123$ M

##

|!|EMB041919035O|!|

A 25.0 cm$^3$ of 1.0 M ethanoic acid and a 25.0 cm$^3$ of 1.0 M hydrochloric acid are each titrated with a sodium hydroxide solution. Which of the following will be the same for these two titrations?

(1) Initial pH

(2) pH at the end point

(3) Volume of sodium hydroxide solution required to reach the end point

A. (1) only

B. (3) only

C. (1) and (2) only

D. (2) and (3) only

□

##B##

|!|EMA041919036O|!|

Which of the following solutions could completely neutralize 25.0 cm$^3$ of 0.2 M sulphuric acid?

(1) 25.0 cm$^3$ of 0.2 M sodium hydroxide solution

(2) 50.0 cm$^3$ of 0.2 M potassium hydroxide solution

(3) 25.0 cm$^3$ of 0.2 M calcium hydroxide solution

A. (1) and (2) only

B. (1) and (3) only

C. (2) and (3) only

D. (1), (2) and (3)

☐

##C##

**Each question below consists of two separate statements. Decide whether each of the two statements is true or false; if both are true, then decide whether or not the second statement is a *correct* explanation of the first statement. Then select one option from A to D according to the following table**:

| | |
|---|---|
| A. | Both statements are true and the 2nd statement is a correct explanation of the 1st statement. |
| B. | Both statements are true and the 2nd statement is NOT a correct explanation of the 1st statement. |
| C. | The 1st statement is false but the 2nd statement is true. |
| D. | Both statements are false. |

<u>Sections 19.−19.2</u>

|!|EMA041919037O|!|

| | |
|---|---|
| A solution of 1.0 M is a standard solution. | A standard solution is a solution of known molarity. |

☐

##A##

<u>Section 19.3</u>

|!|EMA041919038O|!|

| | |
|---|---|
| A 25.0 $cm^3$ pipette is usually used to deliver 22.5 $cm^3$ solution in titration experiment. | There is a graduation mark on a pipette. |

☐

##C A 25.0 $cm^3$ pipette can only deliver exactly 25.0 $cm^3$ solution.##

|!|EMA041919039O|!|

| | |
|---|---|
| Before doing a titration, distilled water is used to wash a conical flask. | Water present in a conical flask will not change the number of moles of solute in the conical flask. |

☐

##A##

<u>Section 19.4</u>

|!|EMB041919040O|!|

| | |
|---|---|
| In a titration, 1 mole of any acid always neutralizes 1 mole of any alkali. | 1 mole of hydrogen ions, $H^+(aq)$ reacts with 1 mole of hydroxide ions, $OH^-(aq)$. |

☐

##C##