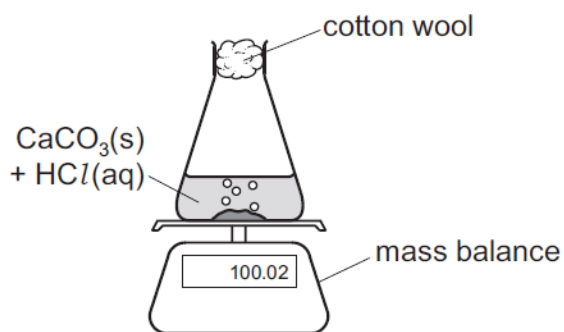


## Chemical reactions – 2020 O Level

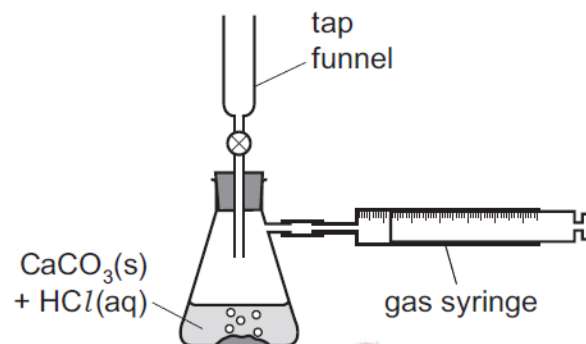
### 1. Nov/2021/Paper\_11/No.2

When calcium carbonate is added to dilute hydrochloric acid, carbon dioxide gas is released.

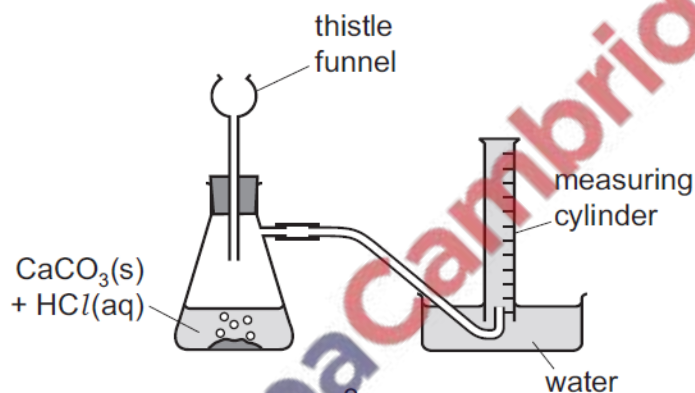
Three sets of apparatus are shown.



1



2



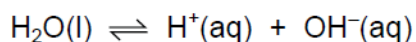
3

Which sets of apparatus are suitable, together with a stop-watch, for following the rate of this reaction?

- A** 1, 2 and 3      **B** 1 and 2 only      **C** 2 only      **D** 2 and 3 only

### 2. Nov/2021/Paper\_11/No.22

When water is liquid, it ionises slightly.



The forward reaction is endothermic.

When the temperature of water is increased, which changes take place?

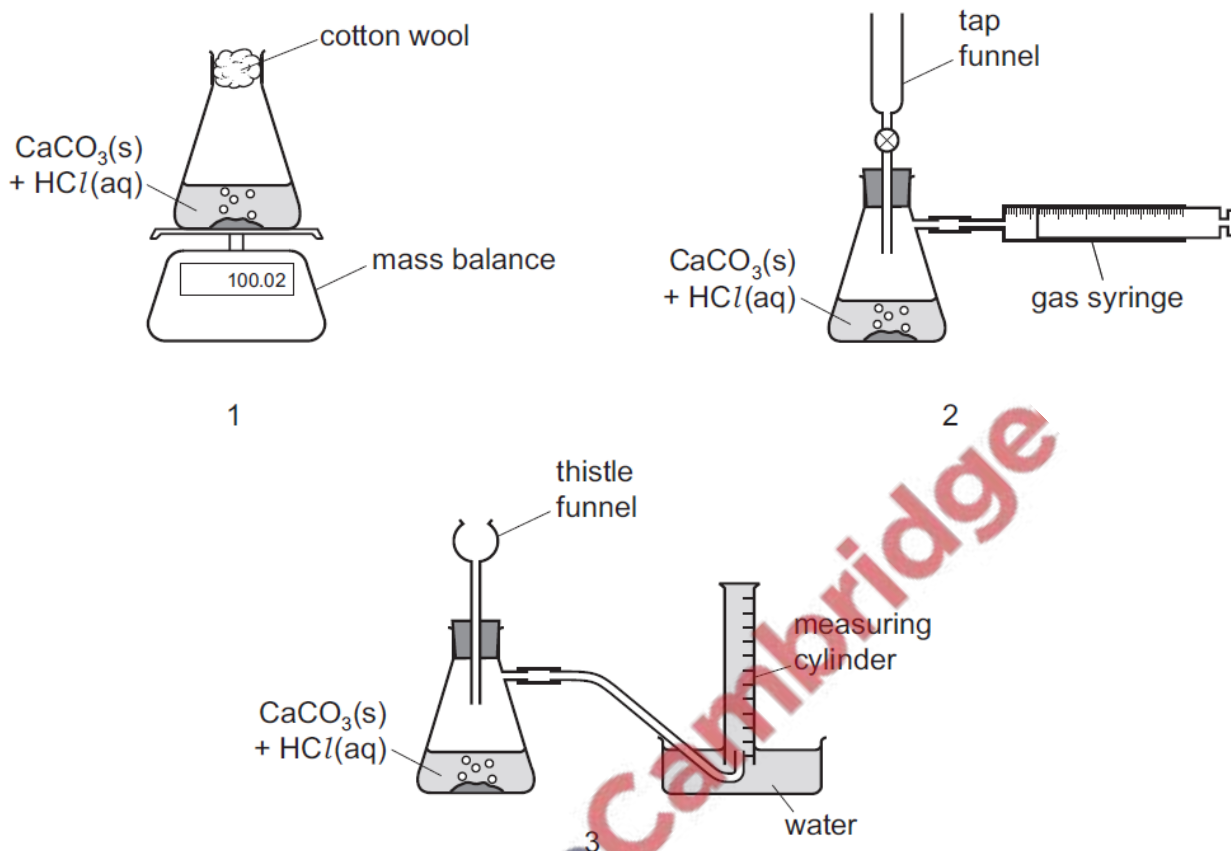
- 1 The water becomes acidic.
- 2 The water becomes alkaline.
- 3 More water molecules form ions.

- A** 1 and 3      **B** 1 only      **C** 2 and 3      **D** 3 only

3. Nov/2021/Paper\_12/No.2

When calcium carbonate is added to dilute hydrochloric acid, carbon dioxide gas is released.

Three sets of apparatus are shown.

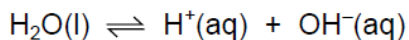


Which sets of apparatus are suitable, together with a stop-watch, for following the rate of this reaction?

- A 1, 2 and 3      B 1 and 2 only      C 2 only      D 2 and 3 only

4. Nov/2021/Paper\_12/No.22

When water is liquid, it ionises slightly.



The forward reaction is endothermic.

When the temperature of water is increased, which changes take place?

- 1 The water becomes acidic.
- 2 The water becomes alkaline.
- 3 More water molecules form ions.

- A 1 and 3      B 1 only      C 2 and 3      D 3 only

5. Nov/2021/Paper\_21/No.9c

(c) When calcium carbonate is heated in a closed container, an equilibrium mixture is formed.



The forward reaction is endothermic.

(i) Describe and explain the effect, if any, on the position of equilibrium when a hole is made in the container.

.....  
.....  
..... [2]

(ii) Describe and explain the effect, if any, on the position of equilibrium when the temperature is increased.

.....  
.....  
..... [2]

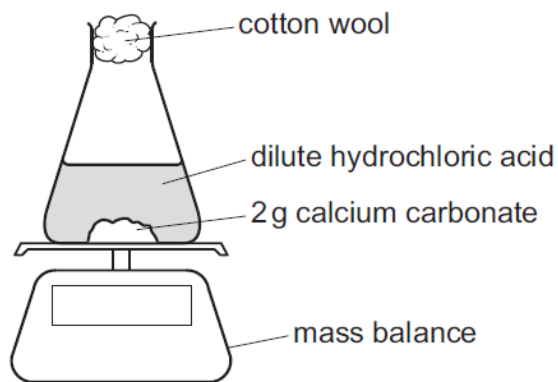
6. Jun/2020/Paper\_11/No.6

Which changes in pressure and temperature would both result in a decrease in the volume of a fixed mass of gas?

- A Decrease the pressure and decrease the temperature.
- B Decrease the pressure and increase the temperature.
- C Increase the pressure and decrease the temperature.
- D Increase the pressure and increase the temperature.

7. Jun/2020/Paper\_11/No.17

The rate of reaction between calcium carbonate and hydrochloric acid is measured in three separate experiments.

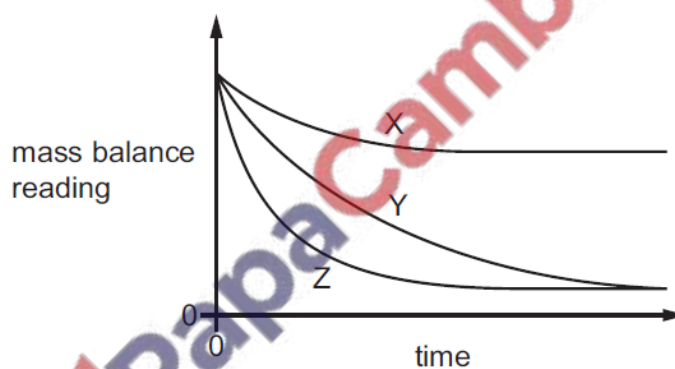


In experiment 1, the calcium carbonate is powdered and an excess of hydrochloric acid is used.

In experiment 2, the calcium carbonate is in lumps and an excess of hydrochloric acid is used.

In experiment 3, the calcium carbonate is in lumps but insufficient hydrochloric acid is used.

The results of these experiments are shown.



Which statement is correct?

- A Experiment 1 is shown by curve X.
- B Experiment 1 is shown by curve Y.
- C Experiment 2 is shown by curve Y.
- D Experiment 3 is shown by curve Z.

8. Jun/2020/Paper\_12/No.13

Which row shows the correct state symbols for the reaction between calcium carbonate and dilute hydrochloric acid? (The conditions are room temperature and pressure.)

	$\text{CaCO}_3$	+	$2\text{HCl}$	$\rightarrow$	$\text{CaCl}_2$	+	$\text{H}_2\text{O}$	+	$\text{CO}_2$
<b>A</b>	s		aq		aq		aq		g
<b>B</b>	s		l		aq		l		g
<b>C</b>	s		l		l		aq		g
<b>D</b>	s		aq		aq		l		g

9. Jun/2020/Paper\_12/No.18

Which change in conditions, for the reaction between zinc and dilute sulfuric acid, increases the rate of reaction by lowering the activation energy?

- A adding a catalyst
- B increasing the concentration of the acid
- C increasing the surface area of the zinc
- D increasing the temperature

10. Jun/2020/Paper\_12/No.18

Which row correctly shows whether the hydrogen ion concentration and the pH of ethanoic acid are higher or lower than those of hydrochloric acid of the same concentration?

	hydrogen ion concentration	pH
<b>A</b>	higher	higher
<b>B</b>	higher	lower
<b>C</b>	lower	higher
<b>D</b>	lower	lower