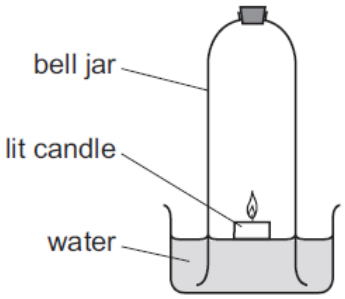
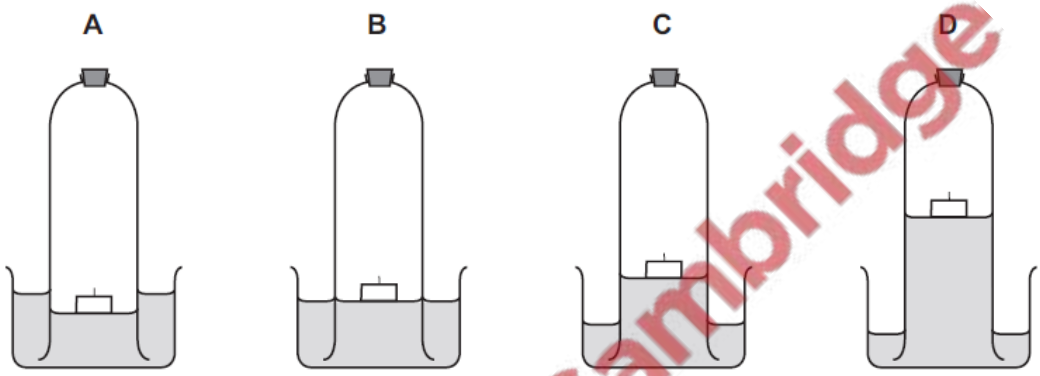
Chemistry of the environment – 2022J O Level 5070

1. June/2022/Paper_11/No.33

The diagram shows an experiment to determine the percentage of oxygen in air.

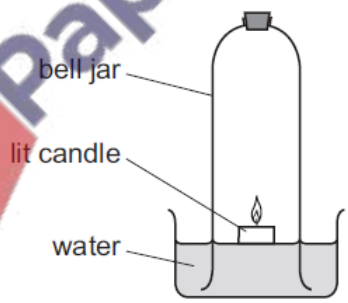


Which diagram shows the correct level of water after the candle stops burning?

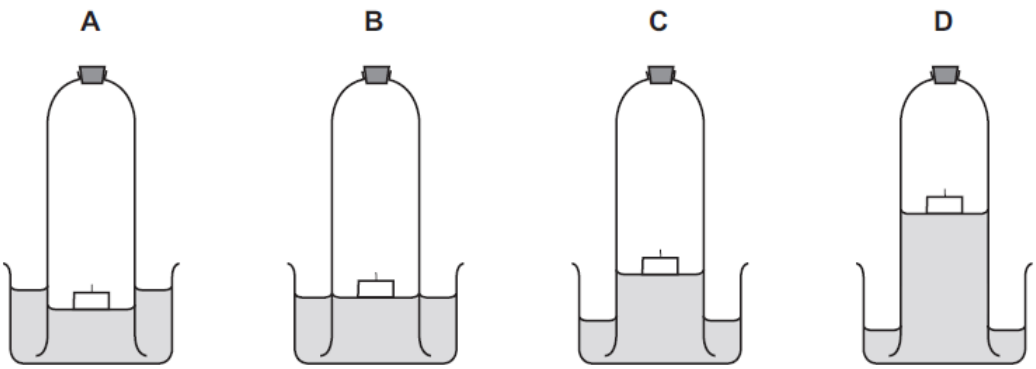


2. June/2022/Paper_12/No.33

The diagram shows an experiment to determine the percentage of oxygen in air.



Which diagram shows the correct level of water after the candle stops burning?



3. June/2022/Paper_21/No.9

Ammonia, NH_3, is used to make nitrogenous fertilisers.

(a) Ammonia is manufactured using the reversible reaction between nitrogen and hydrogen.

Construct the equation for this reversible reaction.

..... [2]

(b) Ammonia is used to make the soluble salt ammonium nitrate, NH_4NO_3.

(i) Name the acid that reacts with ammonia to make ammonium nitrate.

..... [1]

(ii) Calculate the percentage by mass of nitrogen in ammonium nitrate.

percentage by mass = ... [2]

(c) Nitrogenous fertilisers such as ammonium nitrate leach from farmland and cause water pollution problems in rivers and lakes.

(i) Name the process caused by this type of water pollution.

..... [1]

(ii) Explain why this type of water pollution problem is increased when nitrate fertilisers are used instead of other fertilisers.

.....

..... [1]

(d) A farmer adds ammonium nitrate, NH_4NO_3, to soil. The farmer then adds calcium hydroxide, $Ca(OH)_2$, to the same soil.

(i) State the purpose of adding calcium hydroxide to soil.

..... [1]

(ii) Construct the equation for the reaction between ammonium nitrate and calcium hydroxide.

Using your equation, explain why the ammonium nitrate fertiliser is less effective after calcium hydroxide is added.

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.....

.....

..... [2]

[Total: 10]

4. June/2022/Paper_22/No.10

Nitric acid, HNO_3, is used to make fertilisers.

(a) Nitric acid is manufactured from ammonia.

In the first step, ammonia reacts with oxygen.

Balance this equation.

..... NH_3 + ... O_2 → ..... NO + ... H_2O [1]

(b) Nitric acid is used to make the soluble salt potassium nitrate, KNO_3.

(i) Name the alkali that reacts with dilute nitric acid to make potassium nitrate.

..... [1]

(ii) Describe the experimental procedure used to make colourless aqueous potassium nitrate from the alkali and dilute nitric acid.

.....

.....

.....

.....

..... [2]

(iii) Calculate the percentage by mass of nitrogen in potassium nitrate.

percentage = ... [2]

(c) Fertilisers leach into rivers and cause water pollution problems.

(i) Name one **other** pollutant found in river water.

..... [1]

(ii) State **three** processes used in the purification of river water to produce drinking water.

.....

.....

..... [3]

[Total: 10]