

N5 Chemistry
Unit 1: Chemical Changes & Structure
Homework 1.16

1. In an exothermic reaction
- A there is no energy change
 - B energy is released to the surroundings
 - C energy is absorbed from the surroundings
 - D the energy of the products is greater than the energy of the reactants.

Answer _____

2. How many moles are present in 1.7 g of ammonia, NH_3 ?

- A 0.1
- B 1.0
- C 1.7
- D 17

Answer _____

3. What mass of ammonium sulfate, $(\text{NH}_4)_2\text{SO}_4$, is required to produce 0.5 litres of a 1 mol l^{-1} solution?

- A 32 g
- B 64 g
- C 66 g
- D 132 g

Answer _____

4. What is the mass of 0.2 moles of sodium hydroxide?

- A 8.0 g
- B 12.6 g
- C 16.0 g
- D 25.2 g

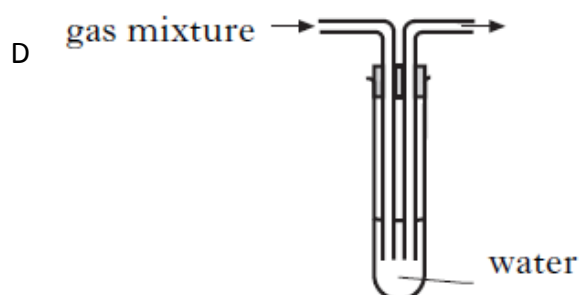
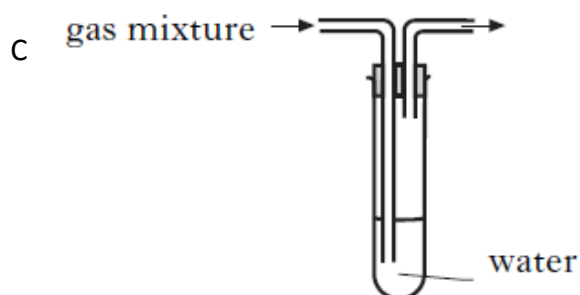
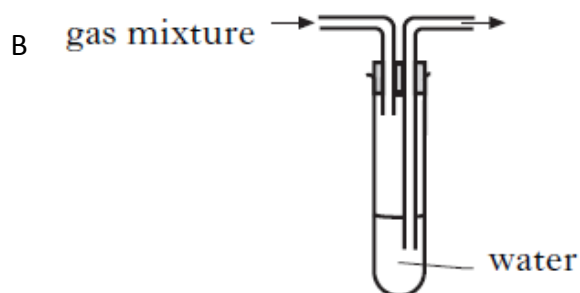
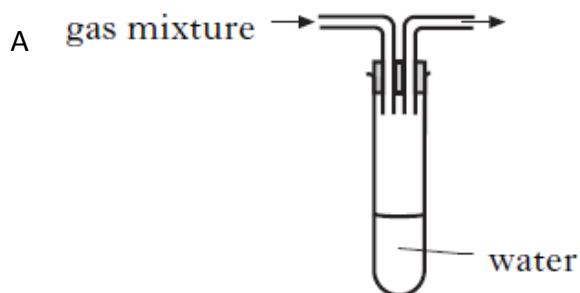
Answer _____

5. Oxygen gas will

- A relight a glowing splint
- B turn lime water cloudy
- C burn with a pop
- D turn damp pH paper red.

Answer _____

6. Which of the following diagrams shows the apparatus which would allow a soluble gas to be removed from a mixture of gases?

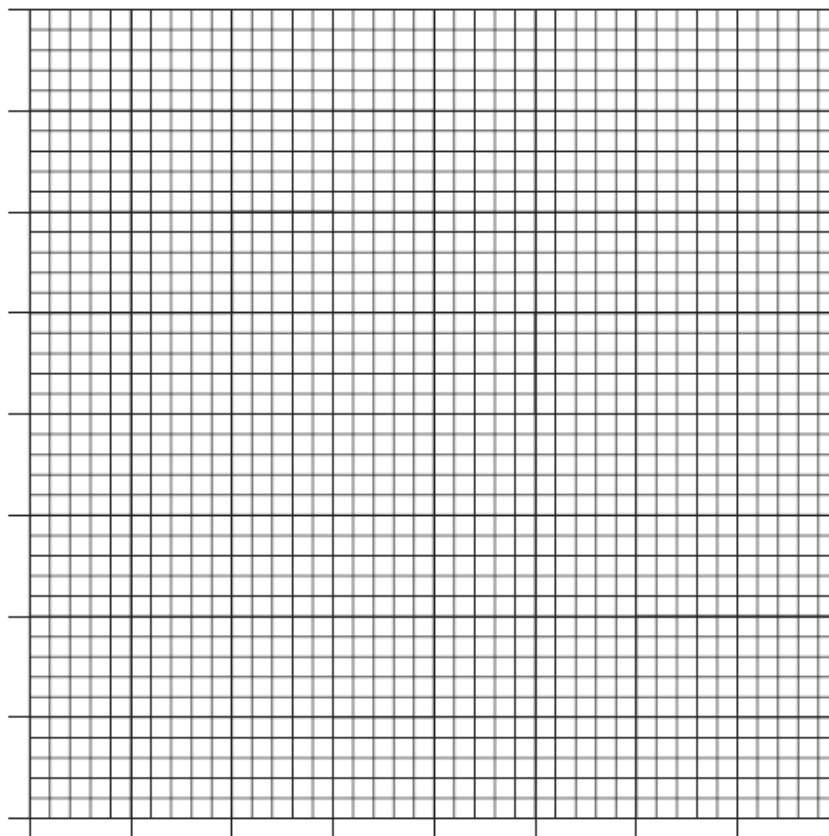


Answer _____

7. A student investigated the reaction between dilute sulfuric acid and sodium carbonate.
- a) One experiment involved measuring the volume of carbon dioxide produced when solid sodium carbonate was used.

Time/s	0	10	30	40	50	60	70
Volume of carbon dioxide/cm³	0	12	29	34	36	37	37

- i) Draw a line graph of these results. Use appropriate scales to fill most of the graph paper.



3

- ii) The experiment was repeated at a higher temperature. The volume and concentration of sulfuric acid and the mass of sodium carbonate were kept the same.

Predict the final volume of carbon dioxide gas produced at this temperature.

_____ cm³

1

- iii) Calculate the average rate of reaction over the 30 second period between 10 and 40 seconds.

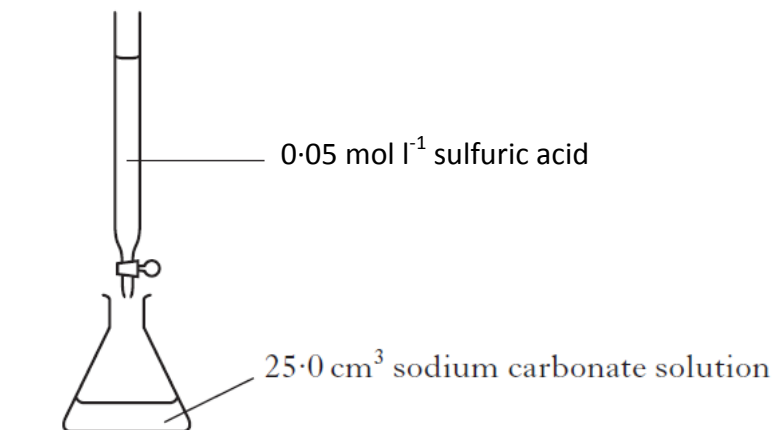
Show your working clearly.

_____ cm³ s⁻¹

1

7. (continued)

- b) Another experiment involved determining the concentration of sodium carbonate solution by titration.



The results showed that 20 cm³ of sulfuric acid was required to neutralise the sodium carbonate solution.

- i) Calculate the number of moles of sulfuric acid in this volume.

_____ moles

2

- ii) One mole of sulfuric acid reacts with one mole of sodium carbonate. Using your answer from part b) i), calculate the concentration of the sodium carbonate solution.

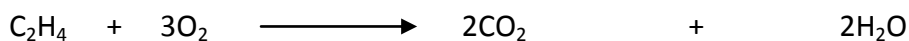
_____ mol l⁻¹

2

- c) Name the salt produced in this reaction. _____

1

8. Ethene (C₂H₄) burns to produce carbon dioxide and water.



Calculate the mass of water produced if 5.6 g ethene is burned completely.

Show your working clearly.

9. Nitrogen trifluoride, NF_3 , is used in the manufacture of plasma screens.
- a) Draw a diagram showing all the outer electrons to represent a molecule of nitrogen trifluoride.

1

- b) The atoms in nitrogen trifluoride are held together by covalent bonds.

Circle the correct words to complete the sentence.

A covalent bond forms when two $\left\{ \begin{array}{l} \text{positive} \\ \text{negative} \\ \text{neutral} \end{array} \right\}$ nuclei are held together by their common attraction for a shared pair of $\left\{ \begin{array}{l} \text{protons} \\ \text{neutrons} \\ \text{electrons} \end{array} \right\}$.

1

- c) The equation for the formation of nitrogen trifluoride, NF_3 , is:



Calculate the mass of nitrogen trifluoride produced from 7 g of nitrogen.

Show your working clearly.

3

Total Marks 24