

Chemistry Paper 1 Marking Scheme

1.

$$C_{(s)} + H_2O_{(g)} \xrightarrow{heat} CO_{(g)} + H_{2(g)}\sqrt{1}$$

- 2.
 - a) Ammonium chloride/NH ₄Cl√1
 - b) $NH_4Cl_{(s)} \rightarrow NH_{3(g)} + HCl_{(g)} \sqrt{}$
- 3. a) Copper (II) Sulphide/CuS.√1

b)
$$2Fe_{(aq)}^{3+} + H_2S_{(g)} \rightarrow 2Fe_{(aq)}^{2+} + 2H_{(aq)}^{+} + S_{(s)}\sqrt{1}$$

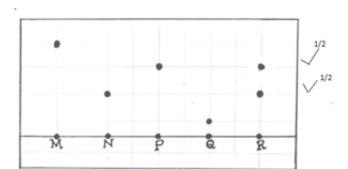
4. a) Yellow/orange solid turns grey.√1

$$Ca(OH)_{2(aq)} + CO_{2(g)} \rightarrow CaCO_{3(s)} + H_2O_{(l)}\sqrt{1}$$

- 5. a)
- $|Zn(NH_3)_4|^{2+}\sqrt{1}$
- b) Lead (II) Chloride√1
- 6. a) Graphite and diamond.√

b)
$$Ca(OH)_{2(aq)} + CO_{2(g)} \rightarrow CaCO_{3(s)} + H_2O_{(l)}\sqrt{1}$$

7. a) Q



8.

a)
$$C_2H_3 = (12 \times 2) + (1 \times 3) = 27$$

 $(C_2H_3)n = 54$
 $27n = 54$
 $n = \frac{54}{27}$
 $n = 2\sqrt{1/2}$

$$(C_2H_3)2 = C_4H_6\sqrt{1/2}$$
 (1)

9. a) Mg has a stronger $\sqrt{\frac{1}{2}}$ metallic bond $\sqrt{\frac{1}{2}}$ than Na. because it donates more electrons into the electron sea though both have giant metallic structure. $\sqrt{\frac{1}{2}}$



Chemistry Paper 1 Marking Scheme

- 10. a) Sodium chloride/NaCl/KCl√1 (1) accept any chloride.
 - b) Bubbling HCl gas through a delivery tube to the water as water will suck backs/lack of a funnel to prevent suck back. √1(1) or Use of a conical flask that doesn't require heat/ did not use round bottomed flask to spread heat.

c)
$$NaCl_{(s)} + H_2SO_{4(i)} \xrightarrow{heat} NaHSO_{4(s)} + HCl_{(g)}\sqrt{1}$$

11. a) Gay Lussac's Law states that when gases reacts they do so in volumes that bear a simple whole number ratio to one another and to the products if gaseous.√1

$$CxHy + O_{2(g)} \rightarrow 2CO_{2(g)} + 2H_2O_{(l)}$$

 $10cm^3 \cdot 30cm^3 \cdot 20cm^3$

Simplest ratio 1:3:2√1

2 moles CO₂ contain 2 moles carbon

$$Cx = C_2 / x = 2\sqrt{1}$$

- 13. .a) 8√1
 - b) Group VI √1 Period 2 √

14. 4. H₃O⁺ H

- 15. No white precipitate.√1
 - (b))i) $2KOH_{(aq)} + CO_{2(g)} \rightarrow K_2CO_{3(aq)} + H_2O_{(i)}\sqrt{1}$
 - (ii) $2H_{2(g)} + O_{2(g)} \rightarrow 2H_2O_{(g)}\sqrt{1}$

16.



Chemistry Paper 1 Marking Scheme

$$NaOH = 23 + 16 + 1 = 40$$

Molarity NaOH =
$$\frac{4}{40}$$
 = 0.1M $\sqrt{1/2}$

Moles NaOH=
$$0.1 \times \frac{20}{1000} = 0.002 \, moles \, \sqrt{1/2}$$

$$2NaOH_{(aq)} + H_2SO_{4(aq)} \rightarrow Na_2SO_{4(aq)} + 2H_2O_{4(aq)}$$

Moles
$$H_2SO_4 = 0.002 \times \frac{1}{2} = 0.001$$
 moles

Molarity
$$H_2SO_4 = \frac{0.001}{8} \times 1000 \sqrt{1/2}$$

= 0.125M $\sqrt{1/2}$

- 17. a) Concentrated nitric acid.√1
 - b) Prepare the gas in open air/fume. 1 chamber because the gas has a pungent choking smell and is poisonous (½ mark).
- 18. . a) Coke as an alternative source of Carbon (IV) Oxide.√1
 - b) To cool the machines 1/slaking CaO to Ca(OH)₂
 - c) To react and produce ammoniacal brine. $\sqrt{1}$
- Purple acidified $KMnO_4$ remains purple with $C_2H_6 \lor 1$. Purple acidified $KMnO_4$ decolourised 19. . <u>a</u>) by C_2H_4 / turns to colourless. $\sqrt{1}$
 - $Mg_3N_2\sqrt{1}$ magnesium nitride. $\sqrt{1}$

b)
$$Mg_3N_{2(s)} + 6H_2O_{(i)} \rightarrow 3Mg(OH)_{2(aq)} + 2NH_{3(g)}\sqrt{1}$$

- 21. . a) Is the energy required to remove one electron from the outermost energy level of an atom in gaseous state. $\!\!\sqrt{1}$
 - b) S, $\sqrt{1}$ has the smallest atomic size, highest nuclear attraction to outermost electrons and does not easily loose an electron as it requires more energy. $\sqrt{1}$

22.
$$CuCO_{3(s)} \xrightarrow{heat} CuO_{(s)} + CO_{2(g)} \sqrt{1}$$

$$CuCO_3 = 64 + 12 + (16 \times 3) = 124$$

Moles
$$CO_2 = \frac{300}{22400} = 0.0134 \, moles \, \sqrt{1/2}$$

Moles
$$CuCO_3 = 0.0134 \times \frac{1}{1} = 0.0134 \text{ moles}$$

$$83\% = 0.0134 \, moles$$

20. .a)



Chemistry Paper 1 Marking Scheme

$$100\% = \frac{100 \times 0.0134}{83} \sqrt{1/2}$$

= 0.0161 moles

$$1mole CuCO_3 = 124g$$

$$0.0161 moles CuCO_3 = \frac{0.0161 \times 124}{1}$$

23. a) Solution turns from colourless to brown. $\sqrt{1}$ because chlorine displaces bromide from solution forming bromine. $\sqrt{1}$ Reject displace bromine.

b)
$$Cl_{2(g)} + 2Br_{(aq)}^{-} \rightarrow 2Cl_{(aq)}^{-} + Br_{2(aq)}\sqrt{1}$$

- 24. . a) Manganese (IV) Oxide. $\sqrt{1/2}$ speeds up the decomposition of Hydrogen peroxide to produce oxygen $\sqrt{1/2}$. Reject catalyst
 - b) First bubbles are mixed with air/impure.√1
 - c) It is slightly soluble in water.√1

25. a)
$$2H_2S_{(g)} + SO_{2(g)} \rightarrow 2H_2O_{(l)} + 3S_{(s)} \sqrt{1}$$

- b) $SO_2\sqrt{1}$ because the oxidation number of Sulphur in SO_2 has reduced from +4 to $0.\sqrt{1}$ (3)
- 26. 2 electrons.√1
- 27. A suspension is a mixture formed when an insoluble solid is mixed with a liquid. $\sqrt{1}$ A precipitate is a solid substance formed when two fluids are mixed. $\sqrt{1}$

$$39.5 \left(\frac{38 \times 0.01}{100} \right) + \left(\frac{39 \times (99.99 - x)}{100} \right) + \left(\frac{40 \times x}{100} \right)$$

$$39.5 = \frac{0.38}{100} + \left(\frac{3899.61 - 39x}{100}\right) + \frac{40x}{100}$$

$$39.5 = \frac{3899.99 - 39x + 40x}{100}$$

$$39.5 \times 100 = 3899.99 - x$$

$$3950 = 3899.99 - x$$

$$3950 - 3899.99 = -x$$

$$-x = -50.01$$

$$x = 50.01\% \sqrt{1}$$

$$V - 40 = 50.01$$

$$V - 39 = 49.98\sqrt{1}$$



Chemistry Paper 1 Marking Scheme

- 29. a) Inflammable/catches fire easily. $\sqrt{1}$
 - b) Toxic/poisonous/fatal. $\sqrt{1}$
- 30. a) Solid $\sqrt{1/2}$, melting point above room temperature(250C/298K) $\sqrt{1/2}$ (1)
 - b) Has an impurity. $\sqrt{1}$