**SET 9**

**CHEMISTRY**

**PAPER 1**

**MARKING SCHEME**

1.

1. So that it can be visible to avoid accidents

The luminous flame uses less gas

1. All the carbon in if burns totally to form co2 hence no unburnt carbon to form soot.

2. a. B√

b. Z√

3. i. Zn (s) +H2SO4(aq) ZnS04(aq) +H2(g)

ii. Zn(s) +2H2SO4(l) ZnSO4(aq) +2H2O (l) +SO2(g)

NB. Equation must be balanced to earn a mark.

1. Pass the gas through a test-tube containing about 1 cm3 of acidified potassium chromium(iv) where it changes its colour from orange to green.

4. i. Concentrated sulphuric ( vi) acid to dry the gas.

ii. 2Na2O2 (s) +2H20 (l) 4 NaOH(aq) +O2(g)

iii. - Increasing the temperature of the water

- Using powdered sodium peroxide.

5. The colour of the sulphur becomes dark red.( 1m)

ii) The S8 molecules break forming chains which join together to form long chains with 100000 atoms

The long chain becomes intertwined hence increasing the viscosity of sulphur that it could be turned

upside down without pouring out.

6. i. ammonium nitrate/ NH4 NO3

ii. NH4NO3(S) N2O(g) + 2H2O(g)

iii. Its colourless gas

Has sweet smell

Slightly less denser than air

Fairly soluble in cold water

*any two for ½ each); N:B wrong response negates any correct response after it)*

7. a) H2 (g) + Cl2 (g) 2 HCl (g)√1mk

60cm3 40cm3 80cm3

The volume of the resulting gas mixture

= 80cm3 + 20cm3 => 100cm3√ 1mk

b) Volume of the residue = 100cm3 – 80cm3 = 20 cm3√1

8. i. 4HCl (l) + PbO2(s) PbCl2 + 2H2O(l)

ii The mixture must be heated for the reaction to proceed.

iii. In a functional fume chamber or in the open to prevent chlorine from poisoning people

9. i. H2/ hydrogen gas

ii. NO, hydrogen gas is less reactive than calcium hence it cannot remove oxygen from calcium

iii. H2(g) + CUO (s) H2O(g) + CU (S)

10. a) P and R

Have the same atomic number but different mass number

b) R

- It has more electrons than protons.

- number of neutrons = 27 -13 = 14

11. (a) Elements found in group seven of the periodic table/// Elements with seven electrons in the outer

shell.✓1

(b) Iodine has stronger .✓1 intermolecular forces ( under ) of attractions while chlorine has weak

intermolecular forces of attraction.

12. 2+ 2-

P2+ R2-

(i) Both must be drawn and electrons shown to earn marks/Also charges must be shown.

(ii) (a) Ionic bonding ( ½ mk)

(b) Giant ionic structure ( ½mk)

13. (i) Polythene ( 1mk)

(ii) – It pollutes the environment. It is non-biodegradable/burns to form harmful gases ( 1mk)

14. (a) React Lead (II) Carbonate with dilute nitric acid to get a solution of lead nitrate ½ . Dissolve Sodium

Sulphate in distilled water to get its solution, mix lead (II) nitrate solution and sodium sulphate to

obtain lead (II) sulphate residue ½ . Filter to obtain lead (II) sulphate. Dry the residue.✓1­ ( 2mks)

(b) Pb2+(aq) + SO42-(aq) → PbSO4 (s) .✓1 ( 1mk)

15. (a) P4(s) + 10N2O(g)→ 2P2O5(s) + 10N2(g) .✓1­­­

(b) – Manufacture of nitric acid ½

- Manufacture of explosives/nylons/plastics ½

16. (a) Flourine is more reactive ½ than chlorine. It has few energy ½ levels where the nuclear force of

attraction is least blocked ½ hence attracts the incoming electrons ½ easier.

(b) – Flourine has a smaller atomic radius than chlorine ½

- It has fewer energy levels ½

17. (i) B – Cathode ½

A – Anode ½

(ii) The copper (II) chloride should be heated✓1 to melt it.

(iii) 2Cl-(l)→Cl2(g) + 2e- .✓1

18. (i) NO, the gas collected will be a mixture of carbon (II) oxide gas and carbon (IV) oxide gas hence

impure. (2 mks)

Conc.

(ii) C2H2O4(s) CO(g) + CO2(g) + H2O (l) ( 1mk)

H2SO4 (l)

19. (i) RH2 = √MrW ½

Rw√MrH2

√Mw= RH2 x √ MrH2

Rw

MrW = R2H2 x MrH2 ½

R2W

= 62 x 2 ½

1

= 36 x 2

= 72 ½

(ii) CnH2n+2 = 72

CnH2n = 72 – 2 = 70

14n = 70

n = 5

MF = C5H12½

20. Moles of sulphuric acid = 50 x 0.25 = 0.125

1000

M (s) + H2SO4 (aq) → MSO4 (aq) + H2(g)

2NaOH (aq) + H2SO4 (aq) → Na2SO4 (aq) + 2H2O (l)

Moles of NaOH = 5.0 x 1.0

1000

= 5/1000

= 0.005 moles ½

Moles of H2SO4 that reacted with NaOH = ½ moles of NaOH

= ½ x 0.005 moles.

= 0.0025 moles

Moles of H2SO4 that reacted with M = original/moles of H2SO4 moles that reacted with NaOH

Original moles = 50 x 0.25 = 0.0125 moles ½

1000

⇒ 0.0125 – 0.0025 moles ⇒ 0.01 moles ½

Moles of M that reacted = 0.01 moles.

0.01 moles = 0.24g

1 mole = x

x = 1 x 0.24✓ ½

0.01

= 24g

21. – The brown traces of copper metal changed slightly to black due to oxidation by oxygen ✓1 from air.

- The white powder changed to yellow in colour when hot and turned to white ✓1 on cooling.

- There was no reaction between the two reactants because Cu cannot displace Zinc from its oxide since

it is less reactive than Zinc metal. (1mk)

22. (a) W – Sodium ethanoate 1mk

B – Methane 1mk

(b) Substitution. 1 mk

23. (i) Nitrogen (II) Oxide /NO ( 1mk)

(ii) Zn (s) + 4HNO(3)→ Zn (NO3)2 + 2H20 (l) + 2NO2  (1mk)

(iii) – Brown in colour ( 1mk)

- Irritating punget smell

- Denser than air (Any 2 x ½ = 1 mk)

24. a) Sodium sulphite

b) i) Sulphur (IV) oxide is denser than air

ii) It was bleached/turn white

25. (a) oxygen

(b) The ph decreases.

HOCl decomposes to give more HCL, in the mixture.

26. 2Fe 2+(aq) + MnO-4(aq) + 8 H +(aq) 5 Fe3+(aq) + Mn2+(aq) + 4 H20(l)

0.4M, 20cm3

Moles of MnO-4

=0.4 X 20/1000

= 0.008moles

Moles ofFe 2+ = 5x 0.008 moles

= 0.04 moles

Mass of Fe = 0.04 x 56 = 2.24 g.

Moles of Al = (2.8 - 2.24) = 0.56 g.

% of Al = 0.56/2.8 x 100%

= 20%

27. (i) Copper (II) Carbonate/CuCO3 (½ mk)

(ii) Carbon (IV) Oxide/CO2 (½ mk)

(iii) (CuCO3 (s) CuO(s) + CO2 (g) (1 mk)

(iv) (a) A pale blue precipitate is formed ( ½ mk)

(b) A deep blue solution is formed (½ mk)