****

**CHEMISTRY PAPER 1 233/1**

**TRIAL 2,2019**

**FORM 4 PAPER 1**

**MARKING SCHEME**

1. a (i) A √1

 (ii) C√1

 (iii) B√1

 (b) Salt, carbon (IV) oxide, water√1 (4mks)

 2. Hydrogen gas√1 (1mk)

 Elements C H O

1. a) % Mass 64.9 √1 13.5 21.6

Molar mass 12 1 16

Moles 5.41 13.5√1 1.35

Ratio 4 10 1

Empirical formula C4 H10O (3mks)

(b) Molar mass (C4H10O)n =74

 74 n =74 n=1√ ½

 74 74

 =C4H10O√ ½ (1mk)

1. Solvent front

(a)Base line shown on the diagram (1mk)

(b) A√(1)& 1 √(1) (2mks)

1. Na2 CO3+ H2SO4 Na2SO4 + CO2 ( g) + HO2 (l)

Moles of Na2CO3 =20x0.1 √(1) = 0.002 moles

 1000

Mole ratio 1:1√1 Moles of acid = 0.002√1

Molarity = 0.002 x 1000 =0.15 MH2 SO4

 13

1. 

7. (a) Alkaline earth metal √1 (01)

 (b) P has smallest√1 atomic radius some electrons of P are closer√1 to nucleus

hence strongly held by the nucleus (02)

(c ) Q(s) + 2 H2O 26 H2)√ + H2(g)(01)

8 (a) platinum √1(01)

 (b)Brown fumes, hot rod continues to glow (02)

9. (a) ensure iron fillings √1 stick at the top of gas jar (01)

 (b) Ironfillings change √ to brown as it combines with water and oxygen to form

 Rust .Water rises in gas jar to occupy the space that was left when oxygen was used up.

10. Hygroscopy is the process by which salts

(a) Absorb water when exposed to atmosphere and become damp: while efflorescence is the process by which salts lose their water of crystallization to the at atmosphere. (02)

(b) To a given volume of nitric (v) acid add excess of lead (II) oxide √1 until some residue are left in the beaker.

- Filter to √1 to obtain Lead (II) Nitrate solution and lead (II) oxide residue.

- To the filtrate √1add excess solution of sodium sulphate to ensure complete precipitation.

- Filter to obtain√ lead (II) sulphate as residue and sodium nitrate solution as filtrate.

- Rinse the residue and dry√1 between filter papers.

11. (a) Are atoms of the same element with same atomic number but different mass number. (2mks)

35.5=35xy+ (100-y) 37

 100

35.5 =35y + 37000- 37$x$ cl = 100 - 75

3550 = 35x – 37$x$ +3700 = 25 %

3550 – 3700 = -2y

-150 = -2$x$

$x$= 75% (2mks)

12. Aluminum reacts with oxygen forming insoluble aluminum oxide which prevent further corrosion. (1mks)

13. Pass the two gases separately through Ca(OH)2 Solution. White ppt is observed with carbon (IV) Oxide while no white ppt formed with carbon(II) Oxide (2 mks)

14. i) The rate of diffusion of a gas is inversely proportional to the square root of its density provided physical conditions remain constant. ( 1mk)

ii)

$\frac{RA}{RB}=\sqrt{\frac{MB}{MA}}$ $RSO\_{2}=\frac{4}{2}$

$= \frac{4}{RSO\_{2}}=\sqrt{\frac{64}{16}}$ $RSO\_{2}=$ 2cm3/s

 $\frac{4}{RSO\_{2}}$ $=2$

15. (i) Methane (1mk)

 (ii) Sodium hydroxide (1mk)

 (iii)Absorb moisture from the air so as to ensure sodium hydroxide remain

 in solid state (1mk)

16. (a) Y-2.8.6 ( ½ mk)

 Z- 2.8.8.2 ( ½ mk)

 b) 40 (1mk)

17 (a) white solid (1mk)

 (b) 2Mg(s) + O2(g) 2MgO(S)

 (C)6 Mg (S) +2N2(g) 2Mg3N2 (S) Mg 3 N2 white solid (1mk)

18. Weak acid has less hydrogen ion concentration per given volume while dilute acid has higher solvent molecule concentration per given volume (2mks)

(b) Acid – NH4+√(½) reason donate the proton√(½) (H+) ( 1mk)

19. (a) ca2+ or Mg2+ (1mk)

20. (a) Mg2+ + CO32- Mgco3 (s)  (1 mk)

 (b) Deposition of fir which is an insulator (1mk)

 H cl cl H

21. H C C C C H

 H H H H (1mk)

(ii) Addition reaction (1mk)

(iii) Alkenes (1mk)

22. i) Transition temperature (1mk)

 ii) J- Rhombic sulphur (α sulphur) ( 1mk)

 K-Monoclinic sulphur (β Sulphur) ( 1mk)

23. carbon atoms in diamond are bonded to each other by strong covalent bonds while in graphite it has weak intermolecular forces between the hexagonal layers hence slide over each other (2mks)

24. Bond breaking Bond formation

1x435 = 435 √(1) 2x431 =862√(1)

1x244 = 244

 + 679

Total energy Bond breaking + bond formation

679 +(-862) (1)

= - 183 kJ/Mol (3mks)

25. (a) A- Anode (1mk)

 B- Cathode (1mk)

 b) Brown fumes are seen (1mk)

 (c) pb 2+ +2e pb (s) (1mk)

26. – Wrong drying agent

 a) Wrong method of gas collection (2mks)

 b) NH4CL(s) + KOH(aq) Kcl(S) +NH3 (g)+HO2 (l) (1mk)

27.(i) potassium Bromide (1mk)

 (ii) 60 -55 = 5g (1mk)

iii) Fractional crystallization (1mk)

28. i) it changes from white to blue (1mk)

 ii)Pbo(s)+H2(g) Pb (s) +H 2O (l) (1mk)

 iii) Reduction (1mk)