*CHEMISTRY FORM 2 MARKING SCHEME*

**1. (a)** **(i)** For smooth boiling /prevent spurting **√1mk**

 **(ii)** Increase surface area for condensation **√1mk**

 **(b)** - Extraction of oil from nuts seeds **√1mk**

 - Extraction of natural dyes from plants

 - Extraction of caffeine from tea & coffee

 - Extraction of herbal medicines from plants

 **Any 2 =2mks**

**2. i.** Non-luminous

 **ii.** **A** – Green – blue region.

 **B** – Region of unburnt gas (colourless zone)

**3. i.** Impure √

 It condensed and freezed√ over arrange of temperatures

 *Rej:* Melting point/boiling point

 ii. Particles of the substance in gaseous form are losing kinetic energy √ and come closer to one another, developing stronger interparticle forces of attraction. √

**4. i**. Weak alkali has a PH between 8-11, strong alkali has a PH value of 12-14 √

ii. a) Z,

 b) M

5. i. G;

 ii. Y;

 iii. Solvent front

**•**

**x**

**x**

**x**

**x**

**x**

**X**

**Y**

**F**

**G**

**H**

**•**

**•**

**•**

**•**

**•**

**•**

**•**

**Baseline**

1. Separation of dyes into constituents by use of a moving solvent. (1mk)

6. i. Hydrogen gas .

 ii. Remove magnesium oxide layer on the surface

 iii. Bright white light or

 White powder

1. Mg(s) + H20(g) MgO(s) + H2 (g)

v. Brick liners in furnaces.

 Radio frequency shielding.

vi. Withdraw delivery tube from water before you stop heating to prevent sucking back.

7. Drug abuse is taking drugs for wrong use or intention while drug dependency is the use of drugs frequently to the extent of being addicted. **Two definitions must be correct**.

8.i. Decantation/use of separating funnel

 ii. Use of a magnet (1mk)

 iii. Sublimation (1mk)

 iv. Fractional distillation (1mk)

9. Permanent change temporarily change (1mk) each

* New substance formed - No new substance formed
* Energy is given out or absorbed - No energy is given out or absorbed
* Change in mass - No change in mass
* Irreversible reaction - reversible reaction

10. i. **P** – Manganese (IV) oxide

 **Q** – Anhydrous calcium chloride /calcium oxide

1. ****

Gas jar

(1mk) for correct method

Oxygen

½ mk for equation minus catalyst

1mk with catalyst

Mno2

 iii. 2H202(aq) 2H20(l) + O2(g)

 iv. Extraction of O2 from air.

½ mk

½ mk

Air is first purified to remove dust; dust free air is passed through conc. NaOH to remove CO2; air free of CO2 is then cooled to -25oC to remove water vapour; it is then compressed at -200 atmospheres and cooled to -200oC to form liquid air; liquid air is then separated by fractional distillation, N2 distills out first then O2 which has a higher b.p of -183oC.

½ mk

½ mk

½ mk

½ mk

v. – Used in hospitals by patients with breathing difficulties

 - Used when mixed with helium in deep sea divers & mountain climbers

 - Burn fuels that propel rockets

 - mixed with acetylene used for welding

 - remove impurities during steel making

 11. Easy to clean – don’t easily burn – do not react with reagent.

 Easy to observe

**12.** **(a)** Elements found in group seven of the periodic tables/

Elements with seven electrons in the outer shell *(rej. Salt forming)*✓1

(b) Chlorine is smaller than iodine, therefore Iodine has stronger intermolecular forces.

**13** **(a)** Sodium and chlorine**✓1**



-

+

Empty diagram loses mark

xx

Cl

Na

 **(b)** Silicon and chlorine**✓1**

xx

xx

xx

xx

xx

xx

**Cl**

**Cl**

**Cl**

**Cl**

x•

x•

x•

xx

x•

**Si**

**14 (a) B**&**D; ✓1**

xx

xx

xx

xx

xx

**Have same atomic number (1mk)**

 **b)** 4 **✓1**

**15.** Yellow solid changes to orange. **✓1** A grey residue is formed colourless droplets on cooler parts ; of the tube **✓1**

**16.** **(i) Delocalised electrons** **(1mk)**

**(ii)** Mobile Ions. (1mk)

1. **(i)** M ✓**1**

**(ii)** K **✓1**

**(iii) a)** Simple molecular **✓1**

**b)** Covalent bonds**✓1**

**18.** Add water to the mixture √ Water mixes with the ethanol and forms the lower layer while upper layer is pentane.

 Use a separating funnel; √ to separate pentane, and use fractional distillation; √ 1/2 to obtain ethanol from water √ 1.2

**19. a) (i)** Chloride ions / Cl- ions √1/2mk

**ii)** Sodium ions / Na+ ions √1/2mk

1. Sodium Chloride has strong ionic bonds ; √1/2

 Which requires a lot of energy to √1/2mk break. While HCl has weak van der waal forces √ between its molecules that can easily break.√1/2mk

 X Y

**20. (a)** 2.8.8.1 **✓1** 2.8.1**✓1**

**(b)** Y**✓1**

 **(c)** It has a smaller atomic radius than X and stronger nuclear attraction for outermost energy level electrons that makes electron loss require more energy.**✓1**

**21.**(a)3Mg(s) + N2(g) Mg3N2(s)√

1. Argon - it is inert √

**22.** The laboratory gas burns in excess oxygen

 OR burns completely

 No unburnt carbon remains

 OR no soot is found produced.**✓1**

**23.**RAM =7 x 62 + 3 x 64 √

 10 10

 = 43.4 + 19.2√ **= 62.6**√

**24(a)** Magnesium burns with a brilliant white √ (½) flame to form a white residue. **✓1**

**(b)** **(i)** Mg (s) + H2O (g) MgO (s) + H2 (g) (1)

 **(ii)** 2H2 (g) + O2 (g) 2 H2O (1)

**25(a)** Alkaline earth metals loose 2 electrons while alkali metals loose one electron**.(2mks)**

**(b)** Aluminum has more delocalized electrons i.e. three of them wheas sodium has only one delocalized electron in the

valency shell**. (2mks)**

26. Pair of tongs ✓1

 Holding corrosive or hot solids ✓1

27. Heat copper strongly in air(oxygen) ✓ ½to form CuO. Add excess warm dilute HNO3✓ ½ to the CuO and stir to form Cu(NO3)2(aq).Add excess sodium carbonate solution(or K2CO3(aq)or (NH4)2CO3(aq)) ✓ ½ to precipitate CuCO3. Filter ✓ ½ to obtain CuCO3 asresidue .✓ ½ Wash the residue with distilled water and dry ✓ ½ between filter papers. (WTTE)

28. (a) Carbon (IV) oxide /CO2.

 (b) A blue flame; is observed carbon (II) oxide burn; with a blue flame. (accformular)

29. a) Direction of flow of cold water into and out of the Liebig condenser is wrong ✓1

b) Fractional distillation. (1mk)

 c) Ethanol and water are miscible (1mk)

 Their boiling points are different (1mk)

 but close

30. (a) Number of neutrons = 31 – 15 = 16 🗸¹

 (b) Y – 2.8.8 (1mk)

 (c) The atomic size of y is smaller🗸½ than that of X because has more protons🗸½

than X hence the outermost electrons are more tightly held.

31. a) Q is more reactive than P ✓1 since it has a lower ionization energy meaning it is a larger atom thus can more easily lose its valence electron(s) ✓ 1 (comparison language must be used)

 b) – Size of the atom (1mk)

 - Nuclear charge (1mk)

- Number of electrons being removed.