**SUNRISE ONE TERM 1 EXAMINATION -2023**

***Kenya certificate of Secondary Education***

***FORM 4***

**233/1**

**CHEMISTRY**

**PAPER 1**

**MARKING SCHEME**

1. a) C Most reactive (2mks)

 A

 B

 b) Carbonate C is soluble in water (1mk)

2. a) F (1mk)

 b) D1 (1mk)

3. To Sodium sulphate add barium chloride if precipitate forms add dilute Hcl . If the substance is Na2 SO3 the precipitate dissolves. If the same treatment is given to Na2SO4 a white precipitate forms but insoluble in dilute HCl ( 3mk)

4. A burning magnesium flame decomposes SO2 to form Sulphur and Oxygen. Oxygen reacts with Mg to form MgO. Wooden splint flame burns at a low temperature not hot enough to decompose SO2. (3mks)

5. - Candle goes off since all oxygen is used up🗸.1

- Lime water forms white precipitate due to🗸1 the evolved from combustion of candle wax. (2mk)

6. i. Water 🗸.1

 ii. H – C C – H🗸.1

 iii. Polymerisation 🗸.1

7. - Heat to mixture 🗸1/2 a beaker covered with a watch glass with water🗸 ½ in it. AlCl3

Sublimes🗸 ½ and deposits at the base of the watch glass. Sodium chloride remains🗸 ½ in the beaker as residue. ( 2mks)

8. Salt J🗸1 . Its solubility increases with increase temperature🗸1. (2mks)

9. a) L = 2.8.2 🗸 ½

 M= :2.7🗸 ½ (1mk)

 b) LO🗸 1

 c) Atomic radius of element M is less than ionic radius of M­-, 🗸1 (1mk)

10. a) Galvanization

b) Copper is less reactive than ion. Copper will not corrode. Iron rust instead of copper.

11. 🗸1/2

24 x 3x =54

27x = 54

X= 2.  ( C2H3)2

Molecular formula = C4 H6🗸 ½

b)

 

 But- I- ene



 But-2- ene

2 mentylpropane

But- 2- ene

( Any one of the above structures and name)

12. HOCl (aq) + Dye HCL (aq) + dye [O] 🗸1

 H2SO3 + dye (O) H2SO4 + dye 🗸1

13. a) (i) Q 🗸 ½

 (ii) R 🗸 ½

 b)



14. a) Produce stream 🗸1

 b) Hydrogen 🗸1

 c) Mg(s) + H2 O(g) MgO (s) + H 2 (g)🗸1

15. - Moles of AlCl3 in 250 cm3

* AlCl3 (aq) Al3+(aq) + 3c ( 1am) 🗸1

Moles of Al3+ in 250 cm3

0.0250 x 1 = 0.025 moles 🗸 ½

Number of Al3+ = 0.025 x 6.0 x 1023

= 1.5 x 1022 ions 🗸 ½

16. a) T and V🗸1

 b) T and V 🗸1 Al ( OH) ­3 is amphteric hydroxide🗸1

17. - Graphite🗸1

 - Diamond🗸1

18. 20 cm3 of W takes 12.6 sec

  10cm3 of W

 Mo2 = 16 x 2 = 32🗸 ½

 =

 2 = 2

 0.56252 =

 Mw = 0.56252 x 32= 10.125g🗸1

Accept any other method which is correct.

19.



20. a) Argon is used in ore welding.

 - Used in electrical light bulb

 - Used in the production of titanium

 - Used in growing of crystals of silicon and germanium.

 ( any threes uses 1mk each)

21. a) A-Cl- ( Chloride Ion) 🗸 ½

 B – I- ( Iodide Ion)🗸 ½

 C – Br­­‑ ( Bromide Ion) 🗸1/2 ( 1 ½ mks)

b) The solution turns from colourless to black 🗸 ½ 2 I  (aq)+ Cl 2 (g) 2C-Aq) + I 2 (aq)

22. a. Al3+; Zn2+, Pb2+ present🗸1

 White ppt formed soluble in excess🗸1

b. Zu (OH)2 (s) + 4NH3 (g) [Zu (NH3)4] 2+(aq) + 2OH-(aq) 🗸1

23. - Measure 20 cm3 of HNO3 and place it in a beaker.

 - Add lead (II) Oxide until excess🗸 ½

 - Filter off the lead (II ) nitrate formed 🗸1/2 and transfer the filtrate in a clean beaker.

- Add a solution of sodium carbonate to lead T ½ (II) nutrate a white precipitate forms which is lead (II) carbonate 🗸 2

- Filter off the precipitate and was it with distilled water than to dry the residue between dry filter paper.

24. Separation is done by filtration🗸 1 NaHCO3 is less soluble at low temperature .NH4cl is more soluble at low🗸 temperatures. NaHCO3 crystal form and filtered off.

25. a) Fuel is a substance which releases energy when burned. ( 1mk)

b) Carbon in 🗸 ½ firewood when burnt in insufficient air🗸 ½ forms CO🗸. The gas is poisonous when🗸 ½ breathed in and leads to death carbon ( iv) Oxide is also formed. This gas can form acid rain🗸 and causes global warming. (2mks)

26. Ca CO3(s) CaO(c) + CO2 (g)🗸 1

 40 + 12 + 48🗸 ½ 40+16 ½ 40+1🗸 ½

 100g 56g

 If 100g of CaCO3 produce 56 g of Ca🗸 ½ O

 30g of caCo3

27. - Calcium Ions 🗸 1

 - Magnesium 🗸1

1. a) Substance A🗸1

 b) 55 – 40 = 15g🗸1

 c) Fractional crystallization🗸1

29. i. - Hissing sound produced due to the production of hydrogen gas. 🗸1

 - Darts on the surface of water because hydrogen produced propels it. 🗸1

 - Melts into a silvery ball because of the heat produced during the reaction.

 - Floats on the water because its less denser than water (mark any two correct)

 ii. 2Na(s) + 2H2O(l) →2NaOH(aq) + H2(g) 🗸1

1. i) Mass of solute = 28.4 – 24.2

 = 4.2

 Mass of water = 40.4 – 28.4🗸1

 = 12

 Solubility = 4.2 x 100

 12

 =35g/100gm🗸1

 ii) Ensure that no solid is lost during evaporation🗸1