

WAKISSHA JOINT MOCK EXAMINATIONS MARKING GUIDE

Uganda Certificate of Education
CHEMISRTY 545/2 - 2022



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1. (a) A mixture of two or more metals
(b) (i) Aluminium, copper and magnesium
(ii) Copper and zinc.
(c) (i) Copper: Allow Cu
(ii) Used in making aircraft.

Is a uniform mixture of one or more metals with one or more other substances usually metals or carbon.

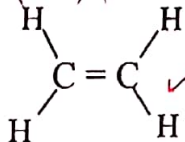
2. (a) By lowering a lighted ~~in burning splint~~ splint into the gas jar containing the gas. It burns with a pop sound. ~~Repeat & burning splint~~



(c) Manufacture of Margarine

Hydrogenation & hardening of oil, aircraft, bicycle parts, pistons, engine, window frame

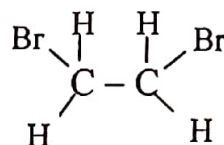
3. (a) (i) Ethene



used in vessels like pipes, sinks, space satellites.

or $\text{H}_2\text{C} = \text{CH}_2$

- (b) (i)



or $\text{CH}_2\text{Br}-\text{CH}_2\text{Br}$ or $\text{Br}-\text{CH}_2-\text{CH}_2-\text{Br}$

(ii) To confirm Unsaturation / the presence of a double bond.

(iii) ~~acidified~~ Potassium manganate (VII) ~~soln~~

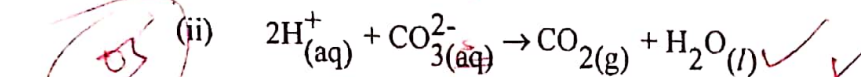
4. (a) (i)	Elements	Mg	N
		0.72	1-0.72 = 0.28
	Moles	$\frac{0.72}{24}$	$\frac{0.28}{14}$
		0.03	0.02
	Ratio	$\frac{0.03}{0.02} = 1.5$	$\frac{0.02}{0.02} = 1$
		$1.5 \times 2 = 3$	$1 \times 2 = 2$

The empirical formula is Mg_3N_2

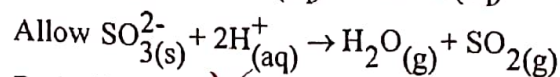
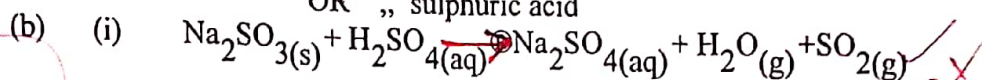


- (b) (i) Using a wash bottle of concentrated hydrochloric acid, dense white fumes are observed.

- (ii) Magnesium hydroxide ALLOW $\text{Mg}(\text{OH})_2$.
5. (a) (i) bubbles of a colourless gas and the solution fade. *effervesces soln fades*
 (ii) $2\text{HOCl}_{(\text{aq})} \xrightarrow{\text{light}} 2\text{HCl}_{(\text{aq})} + \text{O}_{2(\text{g})}$ ✓
 (b) (i) Effervescence ✓

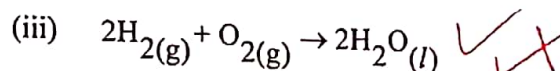


6. (a) Sodium sulphate and dilute hydrochloric acid
 OR „ sulphuric acid



- (ii) By bubbling the gas through conc. sulphuric acid. ✓

7. (a) (i) Evaporation ✓
 (ii) Condensation ✓



- (b) (i) The colour changes from white to blue ✓

- (c) (i) Hygroscopic *Hygroscopic*.

- (ii) *Conc* Sulphuric acid ✓

8. (a) The amount of product formed per unit time. ✓

- (b) - Temperature ✓

- Concentration of the particles/ions/molecules in solution

- (c) (i) *Curve* Reaction Z ✓

- (ii) To speed up the process of decomposition/ provides a surface over which decomposition occurs. ✓

9. (a) (i) Reaction in which heat is given off to the surrounding ✓

- (ii) Cooking ✓

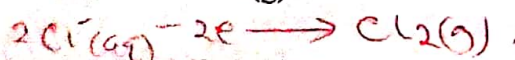
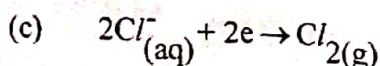
- (b) (i) Presence of oxygen. ✓

- (c) (i) Zinc ✓

- (ii) Zinc is more reactive than iron hence prevents oxygen from reacting iron. *with* ✓

10. (a) (i) To lower the melting point of the electrolyte. ✓

- (b) (i) Carbon, (ii) it cannot be attacked by chlorine. ✓

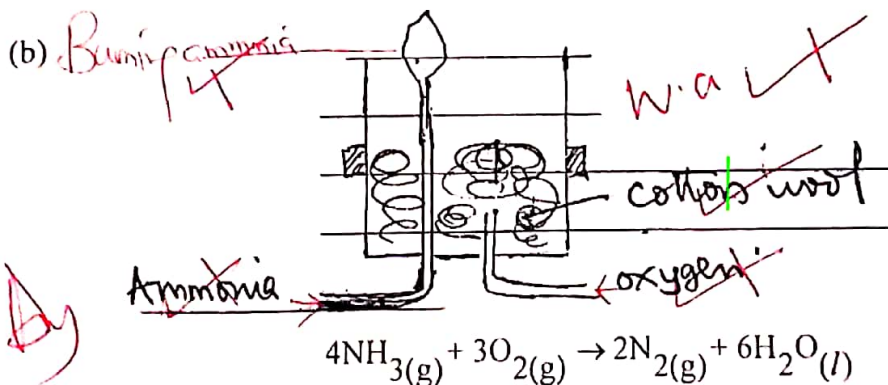


SECTION B

11. (a) (i) Sodium stearate. *potassium stearate*
 (ii) Calcium stearate / Magnesium stearate.
- (b) (i) Ca^{2+} and Mg^{2+} ions
 (ii) $\text{Ca}^{2+}_{(\text{aq})} + 2\text{NaY}_{(\text{aq})} \rightarrow \text{CaY}_{(\text{s})} + 2\text{Na}^{+}_{(\text{aq})}$ ✓
 Soap scum
- (c) (i) Sodium Carbonate *NaHCO₃, Ca(OH)₂*
 (ii) $\text{Na}_2\text{CO}_{3(\text{aq})} + \text{Ca}^{2+}_{(\text{aq})} \rightarrow 2\text{Na}^{+}_{(\text{aq})} + \text{CaCO}_{3(\text{s})}$ ✓
- (d) Soap contains two parts, the polar end and non-polar end, when soap is added to water, the polar part dissolves in water while the non-polar floats on the water surface. When the greasy fabric is put into a soap solution, the non-polar of soap enters the grease. In the process, the grease is broken into small particles and carried off into the solution.
- (e) (i) Contains Calcium for teeth and bone development. *water pipe not present*
 (ii) It waste soap. *relatively more, fine, bubble size is the ratio of 1:3 respectively*

12. (a) Ammonia is manufactured through direct combination of nitrogen and hydrogen. The two gases are made to react at a temperature of 450°C to 500°C and a pressure of 250 atmosphere in the presence of iron as a catalyst.

$$3\text{H}_{2(\text{g})} + \text{N}_{2(\text{g})} \rightleftharpoons 2\text{NH}_{3(\text{g})}$$



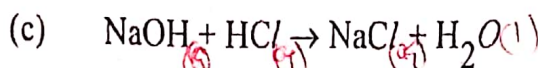
- (c) Dissolve the copper (II) sulphate in water and divide the resultant solution into 2. To the first portion add aqueous ammonia drop wise until in excess, a blue precipitate which dissolves to form a deep blue solution confirms the presence of copper (II) ions. To the second portion add nitric acid followed by barium nitrate, a white precipitate confirms the presence of the sulphate ions. *sh*

13. (a) The heat change when one mole of H^{+} ions react with 1 mole of OH^{-} ions to form 1 mole of water.

- (b) (i) On Graph paper

(ii) 1000cm^3 of solution contains 2 moles of NaOH
 $\therefore 50\text{cm}^3$ of solution contained $\frac{50 \times 2}{1000} = 0.1$ moles.

(iii) 50cm^3



The mole ratio as per the equation is 1:1
 $1\text{HCl} : 1\text{NaOH}$.

Therefore moles of HCl that reacted = 0.1 moles

But 50cm^3 of the solution had 0.1 moles of HCl

$\therefore 1000\text{cm}^3$ of the solution will contain.

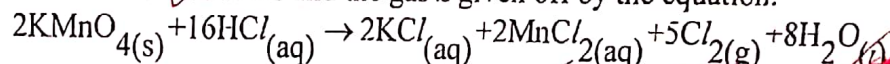
$$\frac{1000 \times 0.1}{50} = 2\text{M}$$

\therefore The molarity of HCl is 2 moles/ dm^3

From the graph, 0.1 moles are neutralized with the production of 5.6 kJ of heat.

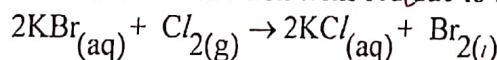
\therefore If 1 mole is neutralized then $\left(\frac{5.6 \times 1}{0.1}\right)$ kJ moles.
 will be produced = 56 kJ/ mole.

14. (a) Place Potassium manganate (VII) crystals in a flat bottomed flask fitted with a delivery tube. Add concentrated hydrochloric acid by means of a funnel. Effervescence occurs and the gas is given off by the equation.

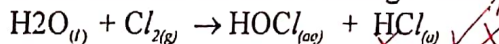


Pass the gas through concentrated sulphuric acid to dry collect the gas by downward delivery.

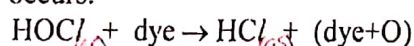
- (b) (i) The colourless solution turns red due to the displacement of Bromine.



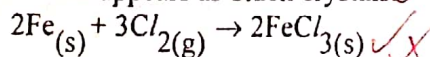
- (ii) When chlorine is bubbled through water, it forms two acids-



The hypochlorous acid is unstable therefore it bleaches the flower, hence the blue colour of the flower turns colourless/bleaching of the flower occurs.



- (iii) Iron reacts with chlorine forming Iron (III) Chloride forming chloride which appears as black crystals



END

1) A graph of heat change against the volume of hydrochloric acid

