BUKAKA CLUSTER EXAMINATIONS
CHEMISTRY PAPER 2
MARKING SCHEME
FORM 4
END OF TERM 1, 2025.

1. (a) transition metals
   (b) H is more reactive than G (1)./ it has a large atomic radius, has a weaker attraction between electrons and nucleus hence it easily loses electrons (1)
   (c) the atomic radius of K is larger than that of L (1). L has a high nuclear charge hence its electrons are strongly attracted (1)
   (d) carbon (group 4/ period II)
   (e) KP_3
   (F) ionic/electrovalent
   (g) G -2.8.1/ M- 2.5
   (h) group 1 or group VII (1). Can form ions by either gaining or losing one electron (1)

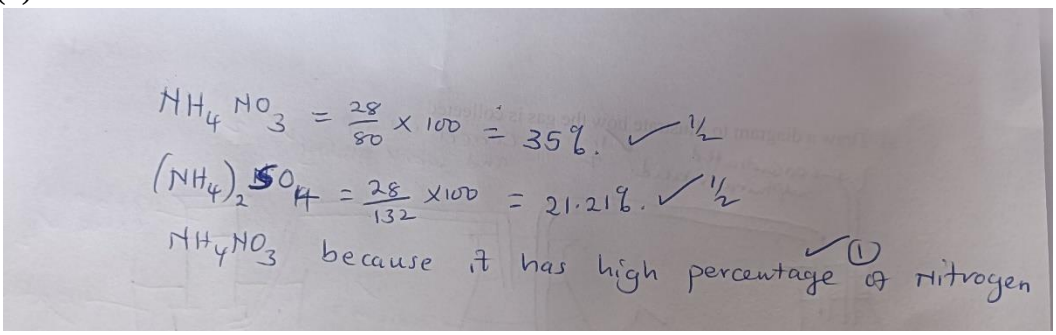
2. (a) carbon (iv) oxide
   (b) sodium hydroxide
   (c) $Cu_{(s)} + O_{2(g)} \longrightarrow 2CUO_{(s)}$

   (d) contain noble gases (1) as impurities (1) – award 1 if impurities are not identified

   (e) – manufacture of ammonia in the Haber process
   - used in light bulbs
   - as a refrigerant in the storage of semen in AI

   (f) (i) iron catalyst

   (ii)



   (iii)- Large-scale refrigeration such as in ships and warehousing
   - Softening water
   - Remove grease stains
   - Manufacture hydrazine which is used as rocket fuel.

3. (a) (i). ethane

(ii) $CH_3CH_2COONa_{(s)} + NaOH_{(s)} \longrightarrow CH_3CH_{3(g)} + Na_2CO_{3(s)}$

(b) (i) conc. Sulphuric acid

(ii) polymerization

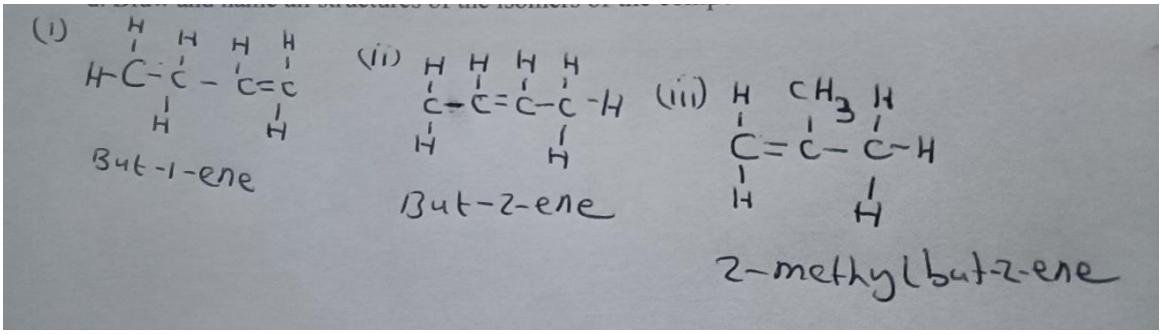
(iii) nickel catalyst/ high temperature 150^0c -250^0c

(iv) hardening of oil to solid fat

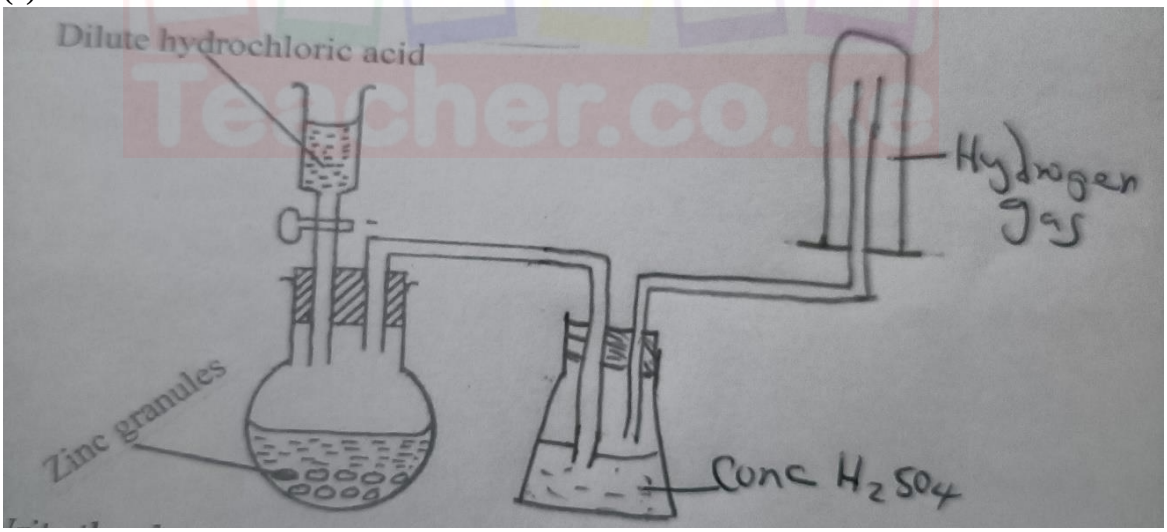
(v) $CH_2CH_2 + HCl \longrightarrow CH_3CH_2Cl$

(c)- using acidified potassium manganate (vii) or bromine water (1)- ethene turns them Colourless (1).

(d)



4. (a)



Naming – conc sulphuric acid (1)

- Hydrogen gas (1)
- Workability (1)

(c) $Zn_{(s)} + 2HCl_{(aq)} \longrightarrow ZnCl_{2(aq)} + H_{2(g)}$

(b) it contains air initially present in the apparatus

(c) (i) red brown solid is formed/ black solid turns to red-brown

(ii) $CuO_{(s)} + H_{2(g)} \longrightarrow Cu_{(s)} + H_2O_{(l)}$

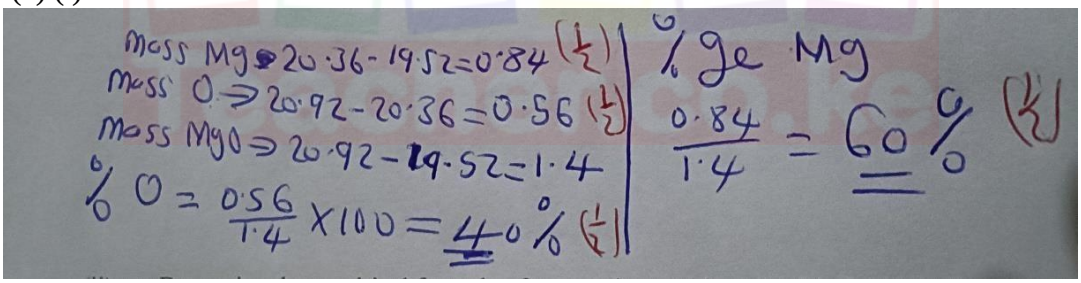
(iii) reducing agent

(iv) Potassium is above hydrogen in the reactivity series.

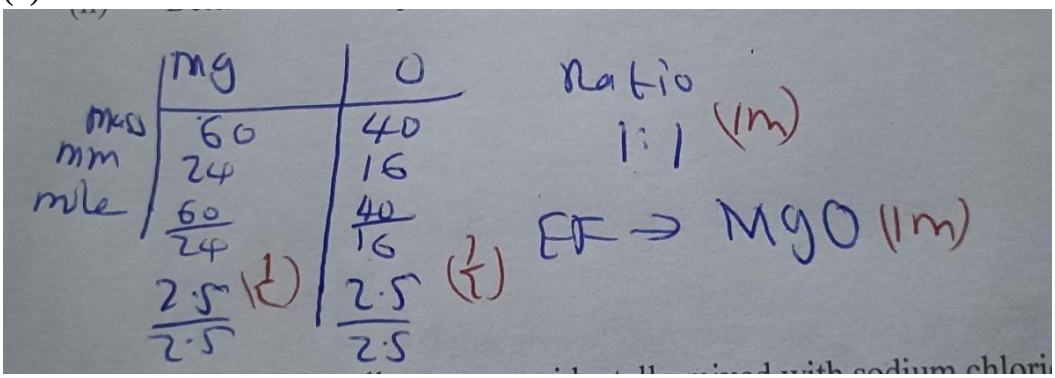
(v) -Large-scale manufacture of ammonia

- hardening of fat
- used in air balloon
- mixed with oxygen in welding
- rocket fuel
-manufacture of HCl
-fuel in fuel cells

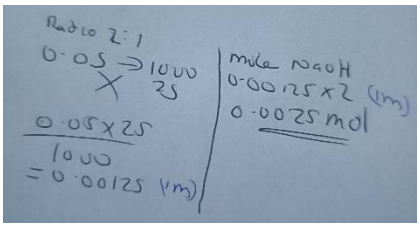
5. (a) (i)



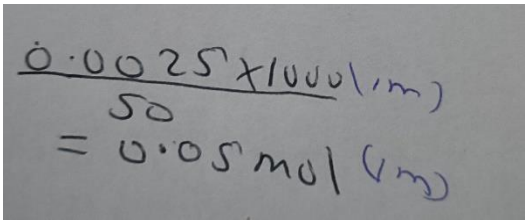
(ii)



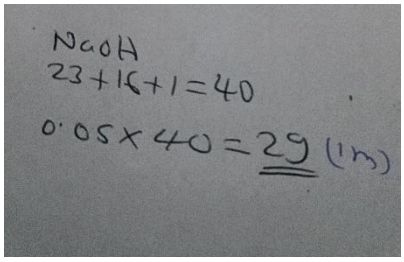
(b) $2NaOH(s) + H2SO_{4(aq)} \longrightarrow Na_2SO_{4(aq)} + H_2O\ (l)$



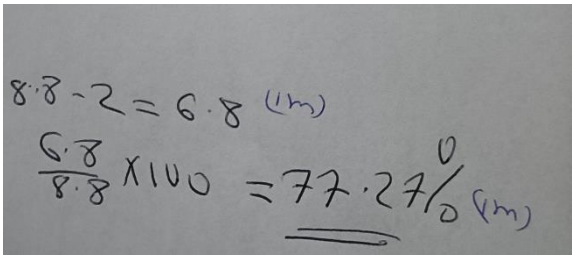
II.



I.



IV.



6. (a) (i) Pipe B

(ii) A-hot compressed air

C- Superheated water

(iii) transition temperature

(iv) – manufacture of sulphuric acid

-hardening of rubber

- manufacture of dyes and fireworks
- as a fungicide

-manufacture of bleaching agents for paper industry

(b) (i) sulphur

(ii) dust particles in air

(iii) to prevent poisoning of the catalyst

(iv)

$2SO_{3(g)} + O_{2(g)} \longrightarrow 2SO_{3(g)}$

$H_2S_2O_{7(l)} + H_2O_{(l)} \longrightarrow 2H_2SO_{4(l)}$

(V) vanadium (v) oxide

(vi) when dissolved in water, excessive heat is generated that boils the acid to produce a mist of fine droplets of sulphuric acid that are dangerous.

7. (a) (i) conc. sulphuric acid and rock salt (solid sodium chloride)
(ii) conc. Sulphuric acid
(iii)

$$2HCl_{(g)} + Fe_{(s)} \longrightarrow FeCl_{2(s)} + H_{2(g)}$$

(iv) to prevent suck back
(v) hydrogen chloride form white precipitates when a glass rod dipped in ammonia is brought close to it.

Solution of hydrogen chloride gas in:	**Blue litmus paper**	**Marble chips**
Water	Turn red	There was effervescence
Methyl benzene	Remain blue	No effervescence

(b) (i) ½ mark each

(ii) hydrogen chloride gas dissolved in water dissociated into ions making the solution acidic. This solution therefore turns the blue litmus paper red and reacts with marble chips forming CO_2 (½). However, when dissolved in methylbenzene it remains in molecular form and hence has no acidic properties.