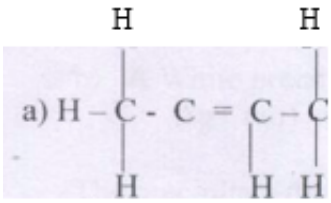
1. (i) C√ ½
(ii) A√ ½ Acetic acid is a weak acid since it is organic in nature√ ½
(iii) E √ ½

2. (a) Bubbles of a-colorless gas which burns with a pop sound√1

(b) Bubbles of a colourless gas with a smell of rotten eggs√ 1

(c) $FeS + 2HCl \longrightarrow H_2S + FeCl_2$ √ 1

3. 

b) Alkenes√½
c) 2.3 - difluorobutane √1

4. The bulb lights in√ ½ set - up I and does not√ ½ light in set-up II
Magnesium has delocalized √ 1 electrons and diamond does not have delocalized electrons√ 1 hence is a non conductor of electricity

5. (a) A reaction that takes place when two solutions are mixed, there is an exchange of ions leading to formation of a ppt
b)

- Add lead II nitrate solution to sodium sulphate

- Filter the mixture to obtain lead sulphate as residue and sodium nitrate as filtrate

- Rinse the residue with distilled water and dry it between filter papers

6. Let the oxidation state for Mn be x

x '3 (-2) =0

x = +6 (the sign must be shown) Systematic name of Mn O3 is manganese (vi) Oxide

7. a) Amount of solute in grams that can dissolve 100g of water to form a saturated solution at a given temperature

b) 52.2 - 19.0= 33.2g

8.

- **Magnesium** continues to burn
- White solid
- Yellow specks

any two **correct** award ½ mones magnesium oxidized to magnesium oxide√ 1

$Ag_{(aq)} + e \longrightarrow Ag_{(s)}$

$IF \longrightarrow 108_{(g)} of\ Ag$

Therefore 0. 075 F $\longrightarrow \frac{0.075 \times 108}{1}$ √ ½

= 8.1 g of Ag√ ½

9. CaCO3 low volume compared to rest because H_2SO_4 reacted with $CaCO_3$ to form $CaSO_4$. an insoluble salt which coated $CaCO_3$ preventing further contact between H_2SO_4 and $CaCO_3$√ 2

10. R.A.M of ethene = 28√ ½

Moles of ethane $\frac{14}{28}$ = 0.5√ ½

Moles of hydrogen -- 0.5√ ½ (3 mks)

Volume of hydrogen = 0.5 x 22.4√ ½

= 1 1.2 liter√ ½

11. a) Increase surface area for dissolution of hydrogen chloride gas - prevents suck back √ ½

b) A White precipitate is formed due to formation insoluble silver chloride//

$Ag^+ (aq) + Cl (aq) \longrightarrow AgCl (s)$

The precipitate dissolved in excess aqueous ammonia to form a colourless solution due to formation of a soluble complex silver ions//

$AgCl(s)\ H\ 2NH_{3\,aq} \longrightarrow [Ag(NH_3)2)^+\ aq + + Cl_{aq}$

12. (i) $3Mg(s) + N2(g) \longrightarrow Mg_3N_{2\,(S)}$ √ ½ √ ½ state symbol

(ii) When water√ ½ is added to magnesium nitride, ammonia gas which turns red litmus paper

13. a) (i) Water / H_2O (i)

(ii) - Use anhydrous copper (ii) sulphate √ ½ change from white to blue//

-Use dry cobalt (ii) chloride paper change from blue to pink √ ½

b. The reddish√ brown hot lead (ii) oxide turns grey√ ½

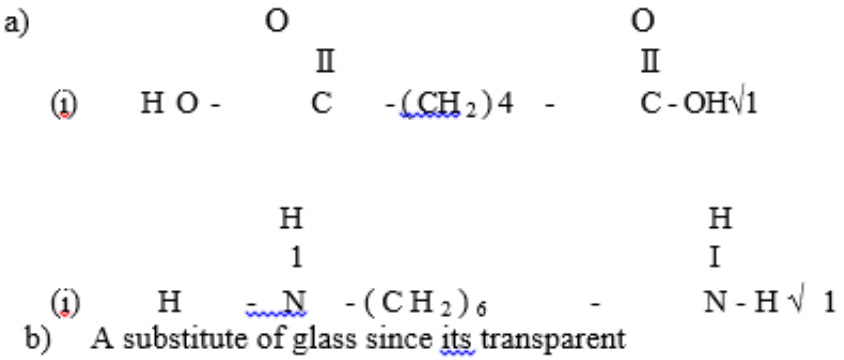
c) $H_{2\,(g)} + fPbO_{(S)} \longrightarrow H_2O(i) \wedge Pb_{(s)}$

14. (a)Nitrogen (1) Oxide √1 - Reject dinitrogen oxide/ nitrous oxide
(b) Has sweet smell and relights a - √1 glowing splint
(c) Was formerly used as an unaesthetic √during dental surgery

15. Deflagrating spoon

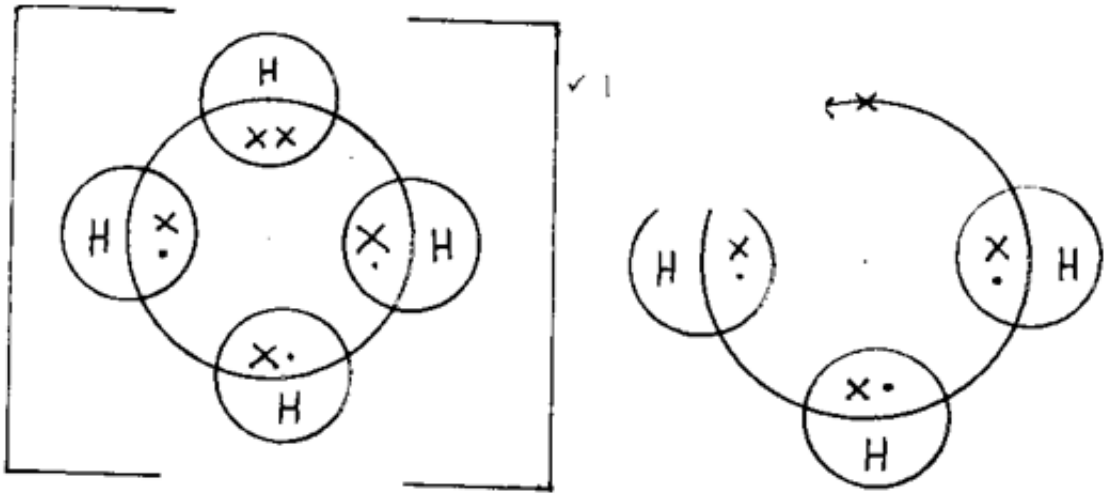
Use: to Burn solid substance

16. a)



b) A substitute of glass since its transparent

17. (a) i



b) Because of the lone pair of electrons

18. a) Copper (II) oxide // $Cuo_{(s)}$√1
b) $CU(OH\,2 \longrightarrow CUO_{(s,} + H_2O$

19. - Distilled water is added to the mixture, potassium Chloride dissolves and lead (ii) chloride does not

- Filter to obtain potassium chloride as a filtrate and lead (ii) chloride as a residue√

-Dry the residue to obtain dry √1 lead ii Chloride

-Evaporate the filtrate using an evaporation dish to obtain solid potassium chloride

20.

i

Element	C	H
%	92.31	7.69
R.A.M.	12	1
Moles	92.31 / 12	7.69√ 1 / 1
RATIO	7.6g :	7.6g √ 1

E.F. CH √½

(CH) = 78

13n 78 √ ½

MF =$(CH)_6$

=C_6 H6 √ ½

ii. H – C =C- CH_2 –CH_2 –CH_2 –CH_3√ ½

21.

PCL_5 hydrolyses √1 in air to form hydrogen chloride fumes√ 1

$PCL_{5\,(s)} + 4\,H_2O_{(l)} \longrightarrow H_3PO_4(aq) + 5Hcl(g)$

22.

a. By thermal decomposition of calcium carbonate//

$CaCo3_{(s)} \xrightarrow{heat} CaO_{(s)} + CO2_{(g)}$

Or burning coke/ carbon in excess air or oxygen// $C_{(s)} + O_{2(g)}$ $CO_{2(g)}$

b. By electrolysis 1 of fused or anhydrous saturated / molten calcium chloride, so that the calcium is deposited at the cathode.

$Ca^{2+} + 2\,e \longrightarrow Ca_{(s)}$ √1

23.

$HCl_{(aq)} + NAOH_{(aq)} \longrightarrow +Nacl(aq) + H_2O_{(l)}$

$100cm^3 \longrightarrow$ 0.5 moles HCl

$30cm^3$ $\frac{30 \times 0.5}{1000}$

= 0.015 moles Hcl√1

Mole Ratio 1:1
No. of moles of NaoH reaching = 0.015√ 1
$25\ cm^3 \longrightarrow$ 0.015 moles NaOH
$1000\ cm^3 \longrightarrow \frac{1000 \times 0.015}{25}$ √1

=0.6m

R.F.M of NaoH = 40
Mass in II = 0.6
40 = 0.6√ 1
Concentration = 24g/1√ 1
Correct units included

24.

a. Q^{3+} 2.8 √ ½
S 2.88 √ ½ Accept the structure drawn correctly.

b. P has a higher M.P. than u√½
P has stronger metallic bonds than u √½
P has stronger nuclear charge than u

c. Element O √ ½
Has the smallest atomic radius//most electronegative.

25.

a. The rate of diffusion of a fixed mass of gas is inversely proportional to the square root of its density, at the same conditions of temperature and pressure √ 1

b. $\frac{Rx}{Ry} = \sqrt{\frac{My}{Mx}}$

$\frac{2}{1} \sqrt{\frac{16}{Mx}}$

$4 = \frac{16}{MX}$

$MX = 4$

26. Poisonous carbon (ii) oxide is produced in absence of enough air.

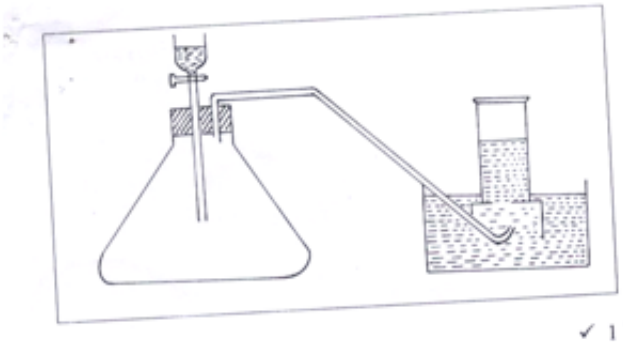
27. a. Hydrated ion III oxide.

b. -Oxygen

-Moisture.

c. Aluminum spontaneously reacts with oxygen to form a thin oxide layer that prevents further oxidation of iron.

28.



✓ 1 Workability
✓ 1 Correct collection method

b) Sodium Peroxid// Na2 O2✓ 1

29. Has white hot glowing carbon particles