MURANG`A EAST 2021 [K.C.S.E TRIAL

CHEMISTRY

PAPER ONE

233/1

MARKING SCHEME

1. a) Existence of element in more than one physical form in the same state

b) Graphite, diamond

c) Making of carbon papers / making tyres/ making printers ink

|  |  |
| --- | --- |
| FeSO4 | H2O |
| Mass 2.84 | 2.36 |
| RFM 152 | 18 |
| No of moles 2.84 = 0.0187  1.52 | 2.36 = 0.1311  18 |
| Mole ratio 0.0187 =1  0.0187 | 0.1311 = 7  0.0187 |

E.F = FeSO4.7H2O

3. a) Mg(s) + 2H+(aq) Mg2+ (aq) + H2(g)

b) Acid R is stronger than acid S

Acid S is stronger acid while S is weak acid

It produces more H+ ions which react with magnesium

It ionizes fully in water or it produces high volume of hydrogen.

4. a) They gain K.E

They gain energy and vibrate faster

b) T1 – Melting point

T2 – Boiling point

c) Energy is used to weaken the intermolecular force of attraction so as to change the substance

from solid to liquid state.

5. Mass of solution = 128.9 - 94.3 = 34.6 (g)

Mass of dry salt = 103.9 -94.3 =9.6 (g)

Mass of solvent = 34.6 – 9.6 = 25 (g)

25.0g of solvent containing 9.6g

100g =? 9.6 x 100

25

Solubility = 38.4g/100g of water

6. a) Nitric (v) acid is more volatile than conc sulphuric (vi) acid or

Nitric (v) acid has a lower B.P than Sulphuric (vi) acid.

b) Sodium nitrate

7. React excess lead oxide with the nitric acid filter to form lead nitrate solution. Dissolve

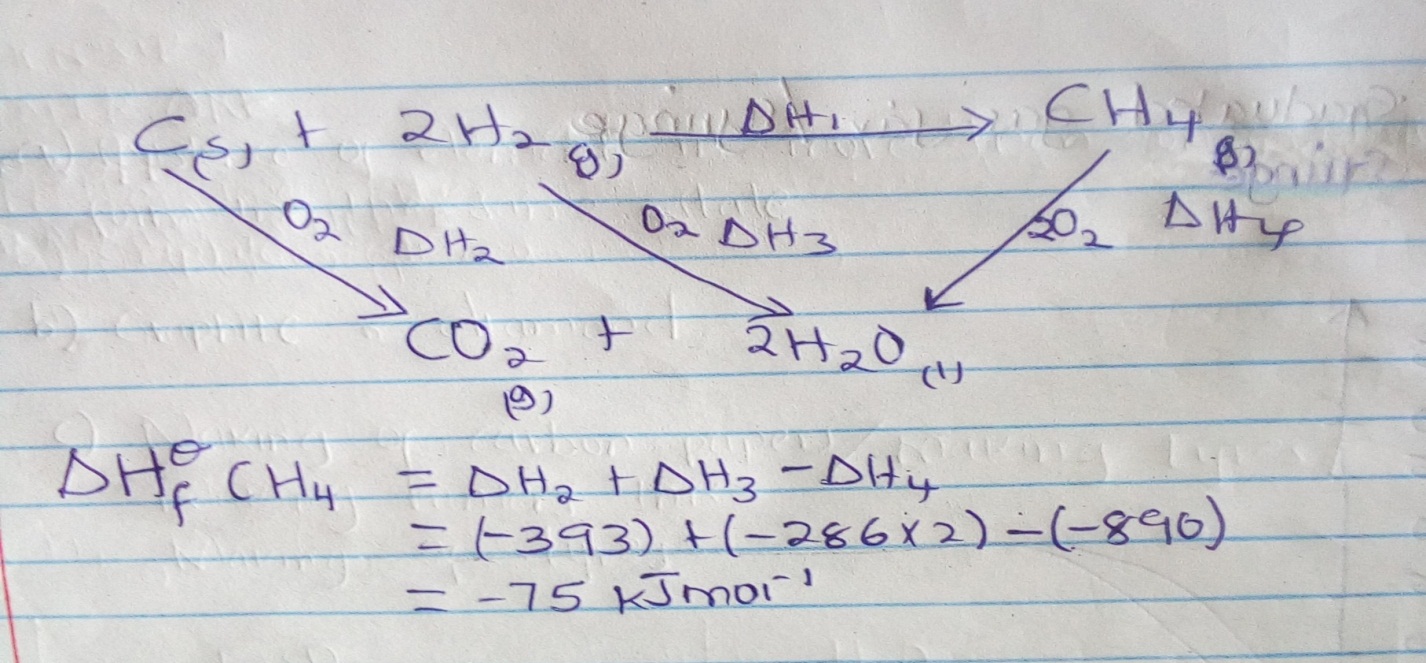
sodium sulphate in water to form solution. Mix sodium sulphate solution with lead nitrate

solution to precipitate lead sulphate. Filter, wash the residue to dry between filter paper.

8 a) Z – concentrated nitric (v) acid

Y – Ammonia solution / ammonium hydroxide, aqueous ammonia.

b) (CU (NH3)4)2+

9. 

10. a) Brown colour intensifies, Reaction is exothermic

Increasing the heat will favour backward reaction

Equilibrium shift to the left and this reaction absorbs heat

b) Pale yellow colour intensifies

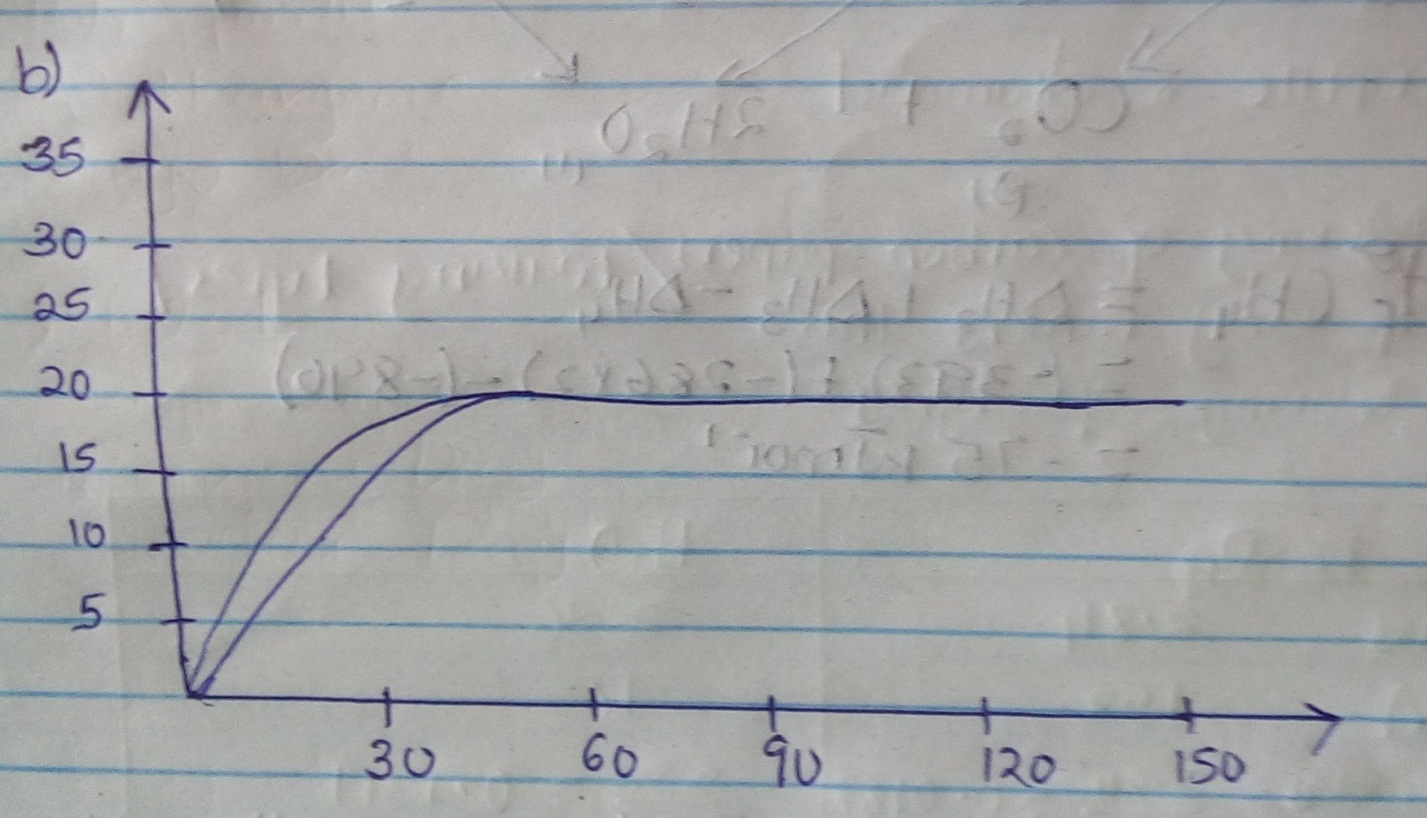
Equilibrium shifts to the right because volume is reduced

11 a) B – Unburnt gas/colourless region/almost colourless region

C – Pale blue region

b) Regulating amount of air entering the chimney

12 a) Graduated gas jar / syringe

b) 

13 a) The solution turned from yellow to pale green

Red brown to pale green/ brown to pale green

b) 2FeCI3 (aq) + H2S (g) 2FeCI2 (aq)+S(s) +2HCL(aq)

14. a) P and M, They have same atomic number

b) n = 15 – 7

= 8

15 a) Identify the solid P

Sodium Sulphite / Potassium Sulphite

b) i) Its denser than air /it was bleached/ it turned white.

ii) Remained red

16 a) The volume of a fixed mass of gas is directly proportional to its absolute temperature at

constant pressure.

b) V1 = V2 0.048 = 0.032 T2 = 198.667 K

T1 T2 298 T2

17 R.A.M = 7 X 62 + 3 X 64

10 10

= 43.4 + 19.2

= 62.6

18 a) Sublimation

b) Esterification

19 a) i) N

ii) G

b) E.M.F cell = E reduction – E oxidation

= (+ 1.36) – (-2.92)

= + 4.29v

20 a) Bond breaking

(C = C) + (Br – Br) + 4 (C – H)

+ 610 KJmol-1 + 193 KJmol-1 + 1652 KJmol-1

= 2455 KJmol-1

Bond formation

2 (C – Br) + (C – C) + 4 (C – H)

560 + 346 + 1652

= 2558

Heat of reaction = Bond breaking + Bond formation

= 2455 KJmol-1 + (- 2558 KJmol-1)

= -103KJmol

b) Addition reaction/Halogenation/Exothermic/Bromination

21. Add warm water to the mixture and stir

PbCl2 dissolves while silver chloride does not

Filter to obtain lead(ii) chloride as filtrate

and silver chloride as residue.

Cool the filtrate to obtain solid lead (ii) chloride

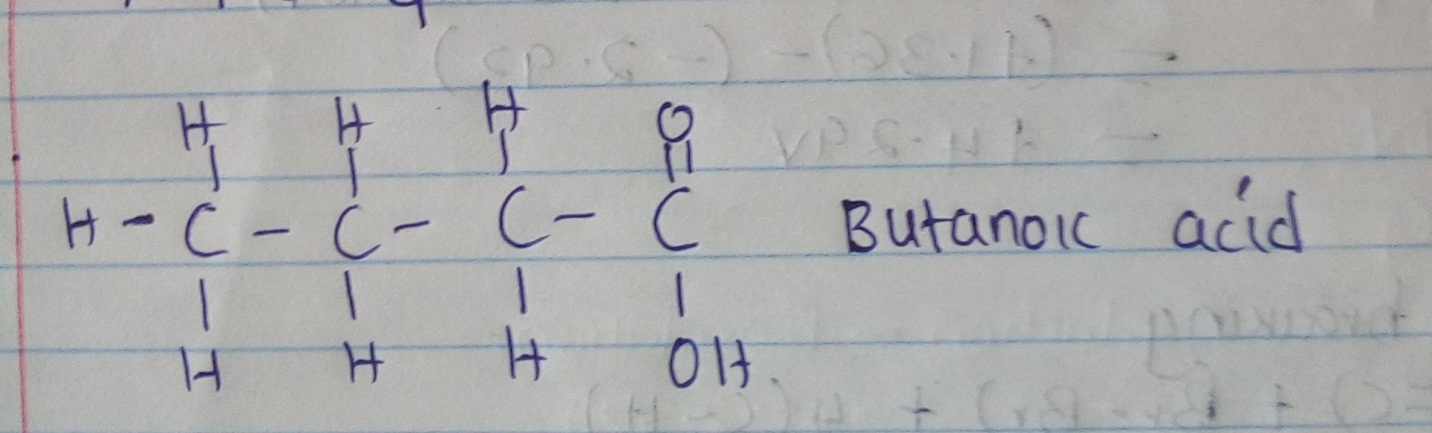
22. Lead (ii) carbonate react with dilute hydrochloric acid

to form an insoluble coat of lead (ii) chloride

on the carbon which stops further reaction

23 a) S because it has a high M.P and B.P and also conducts in aqueous solution

b) P or Q

24. 

25. i) Carbon (iv) oxide / CO2

ii) Leads to global warming/greenhouse effect/acid rain

26. a) 3Mg(s) + N2(g) Mg3N2(g)

b) Neon/Argon, it is noble gas

27 i) Quantity of = 1t

Electricity = 6.42 x 10 x 60

= 6.42 x 600

= 3.852C

ii) 3852c produce 2.74g

2 x 96500 = 2 x 96500 x 2.74

3852

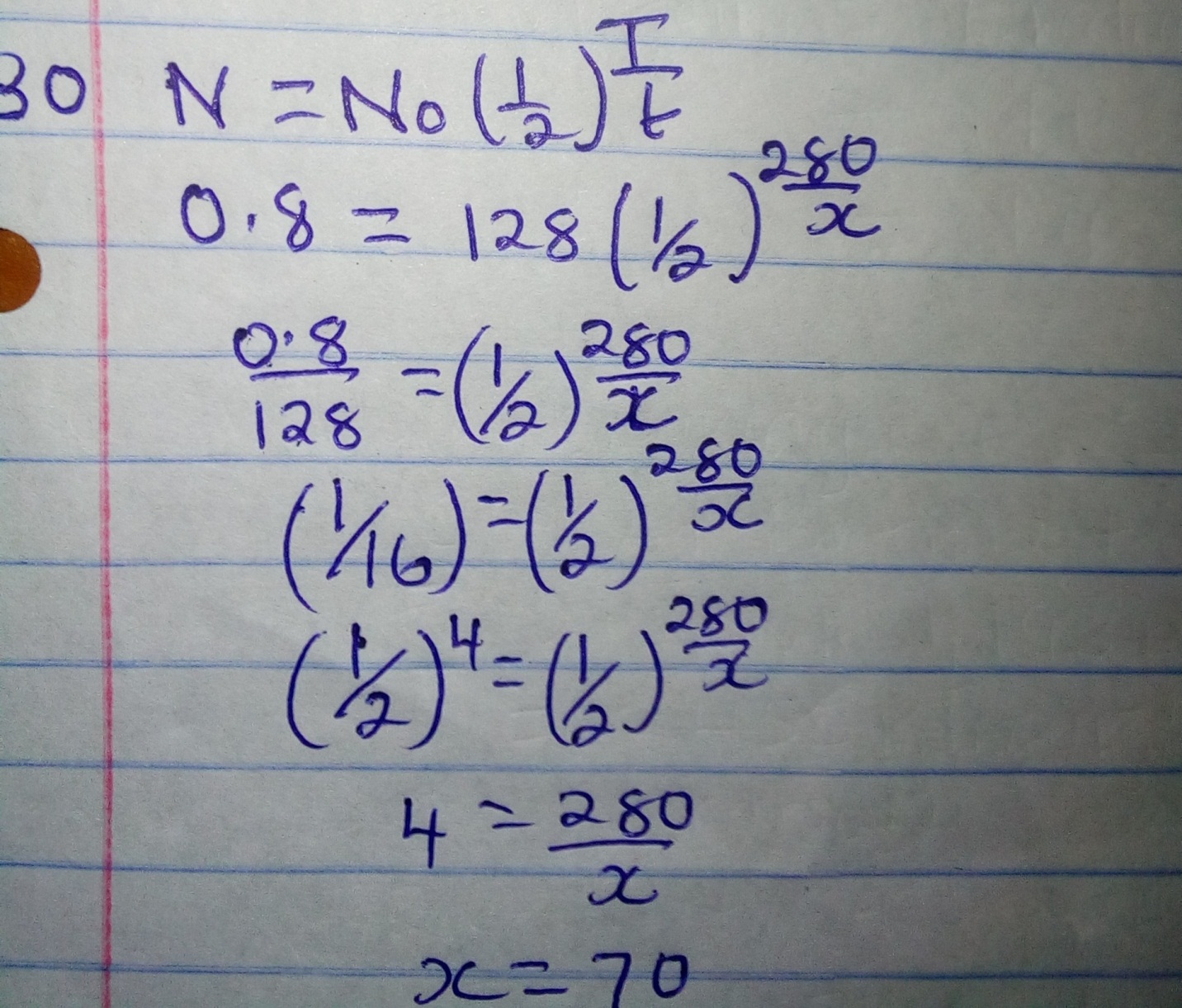
= 137.28

28 Alcl3 is largely covalent /it sublimes when heated

It is made of molecules which do not conduct electricity.

29. i) Polyphenylethane/polystyrene

ii) It is non-biodegradable/pollutes environment

30 

12.8(g) 6.4g  3.2g 1.6g 0.8g

4 t ½ = 280 days

t1/2 = 280

4

= 70 days

31. a) 4NH3(aq) + 5O2(g) 4NO(g) + 6H2O(l)

b) HNO3 (aq) and HN02 (aq)

32. The laboratory gas burns in excess oxygen / burns completely/produces CO2 and H2O

only/No unburnt carbon remains/No soot is produced.