**MARKING SCHEME**

**CHEMISTRY PAPER 2**

**ARISE AND SHINE TRIAL 1 EXAM**

**March/April-2020**

1.(a)(i) Fractional distillation √1 Any two

(ii) Molecular mass 1mk each

- density

- Boiling points

(b)(i). C3H6 √1

(ii). Shake a sample with bromine water √1,C3H8 do not decolourize√1 C3H6 decolourize √1 OR use acidified potassium permanganate C3H8 do not decolourize C3H6 decolourize (Reject chlorine)

Or

Burn a sample of C3H8-burns with a non-luminous flame C3H6-burns with a luminous flame

Or

Use acidified potassium dichromate-C3H8 do not decolourize

-C3H6decolourize

(d)(i). Ethanol √1/C2H5OH /CH3CH2OH √1

(ii). slightly soluble in water/insoluble in water

(d). Name-polythene/polyethen √1

Disadvantage-it is non-biodegradable poisonous gases when burn√ (Any one)

2.(a). Name the method that can be used to obtain pure iron (III) chloride from a mixture of iron (III) chloride and sodium chloride (1mark)

Sublimation √1

(b). A student was provided with a mixture of sunflower flour, common salt and a red dye. The characteristics of the three substances in the mixture are given in the able below.

|  |  |  |
| --- | --- | --- |
| **Substance** | **Solubility in water** | **Solubility in ethanol** |
| Sunflower flour | Insoluble | Insoluble |
| Common salt | Soluble | Insoluble |
| Solid red dye | soluble | soluble |

The student was provided with ethanol and any other materials needed. Describe how the student can be separate the mixture into its three components. (3 marks)

Add ethanol √½

Filter √½

Evaporate √½

Add water √½

Filter √½

Evaporate ½

(c) The diagram shows part of the periodic table. The letters do not represent the actual symbols of the elements. Use the diagram to answer the questions that follow.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | | | | | | Q |
| R |  |  |  |  | **K√1** | V | W |  |
|  | Z |  |  |  |  |  | X |  |
| Y |  |  | **N** |  |  |  |  |  |

(i). - W has a shorter atomic radius than X √1

- W accepts electrons more readily than X√1

- W has less energy levels than X

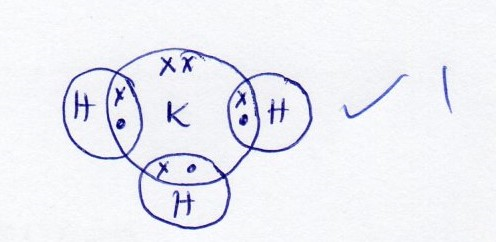
- W has less screening effects than X Any two

(ii). – R has a higher m.p than √T.R has a giant metallic structure while T has a molecular structure/R has metallic bonds while R has eak√1 van der waals forces

(iii). –ZW2 √1 penalize use of equation

(iv).

(v).



1. Q/He √1
2. N/A √1

3(a). Purify to remove impurities ½ √,bubble through ½ √ NaOH/KOH to remove CO2,rduce the ½ √temp,to remove water vapor compress to liquefy the residual air, then fractional distillation to obtain oxygen at -180oC

1. concentrated sulphuric (vi) acid √1
2. SO2(aq) + H2SO4(l) H2S2O7(l) √1

c). (i). Platinum √1

(ii). It is cheap/cheaper √½

Not easily poisoned/action stopped by impurities ½

(d). Turns from blue to white. Forms white powder sulphuric (VI)√1 acid dehydrates copper (II) sulphate crystals/remove water of crystallization.

e). It is less volatile √1

(f). Manufacture of sulphate fertilizer/superphosphate fertilizer/production of Ray on making dyes/used in car batteries/As an electroly manufacture of sosaples detergents/cleaning of metals manufacture of pain HCL/HNO3,Oleum. As a drying agent, as adehydrating agent/manufacture of nylon AL2SO4/ALCOH3/sulphate drugs, pigments

Any four ½ each

4(a). Energy change that occurs when one mole of a substance is completely burnt in oxygen √1

(b). The energy changes in converting reactants to √1

Products is the same regardless of the path in which the chemical changed occurs

∆HC(Graphite) = - 393kJ mol-1

∆HC(H2(g)) = -286kJ mol-1

∆H

(a). 3C(s) + H2(g)  C3H8(g) √1

(II)

3C(s)+4H2(g) AH3 C3H8

1√ + AH2

+ 2O2  AH

∆H1 3O2 3CO2 +4H2O 5O2 + AH

(iii). ∆H4 = ∆H1 + ∆H2-∆H3 √1 ∆H4=-879-1144+1√104

=(-393x3) + (4x-286)+-(-104) ∆H4=-1919kJmol-1

Penalize ½ for wrong missing unit

(d). - Availability

- Safety Any one

e). Dil HNO3 andHCl√1 ionize fully in water while ethanoic acid partially ionizes√1

5.(a). It is a solution which cannot dissolve any more solute at a particular temperature √1

(b)(i) I-24g/100g of water √1

II- mass dissolved=62g ½

* mass of undissolved =80-62=18g√1/2

c). RFM of KNO3 = 39+14+16x3

=101 √½

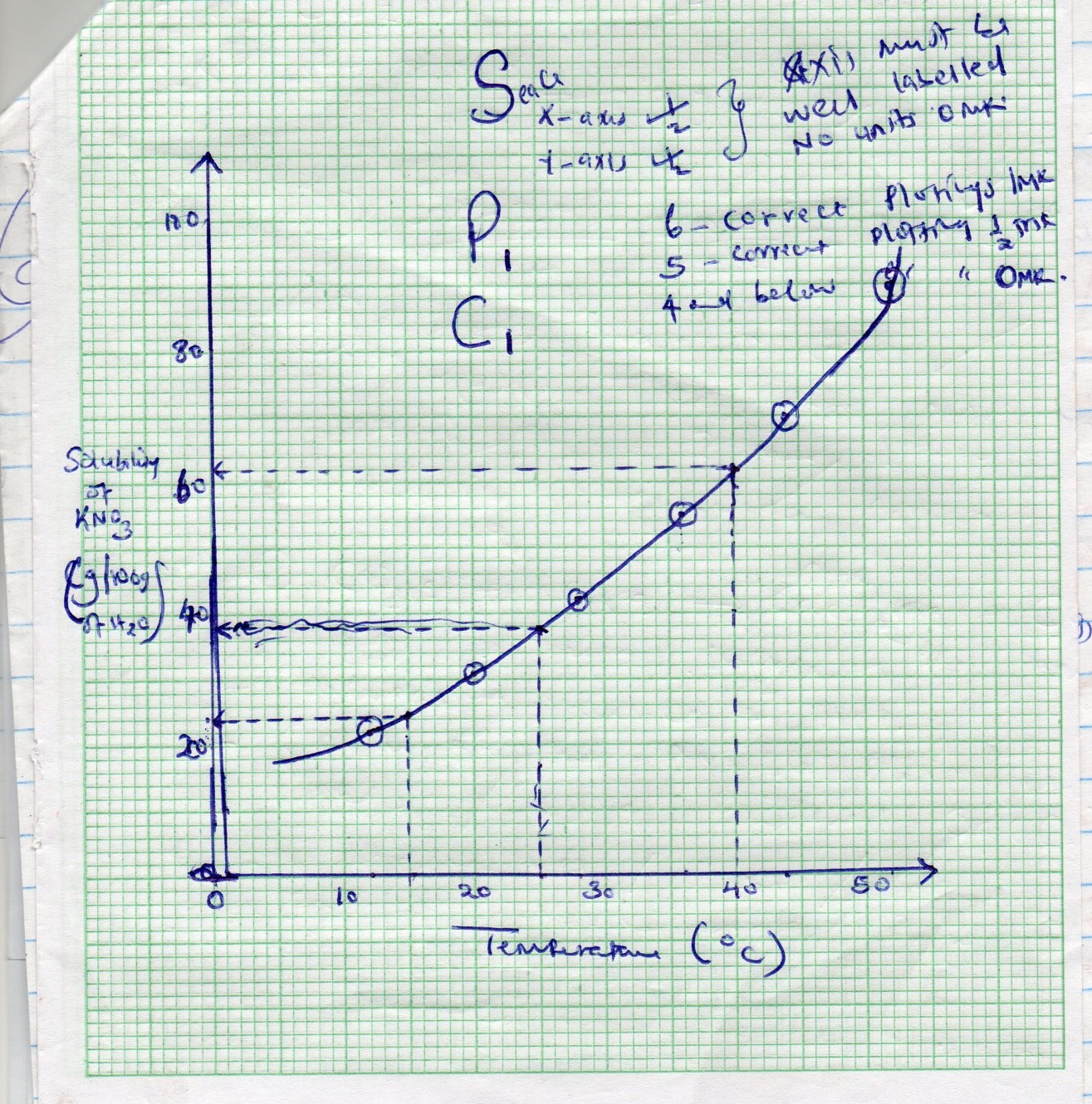
Mole of KNO3 at 18oc = 24 √½ =0.2376√ ½ moles

101

Molarity = no of moles x1000 = 0.2376 √1/2 x 1000√1/2

Volume 100

=2.376MKNO3 √1/2



6(a)(i) - preservative √½

* Add taste/flavor√ ½

(ii). Effervescence occur √1

* CO2 was dissolved under pressure √1

(iii). - H2CO3 √1 penalize fully for an equation

(b)(i). 2zn(NO3)2(s) 2ZnO(s) + 4NO2(g) + O2(g) penalize √½ for wrong /missing state

Symbols

(ii). 5.76 x =0.03 √½

188.5

Moles of NO2 = 4 x0.03 = 0.06√ ½

2

Moles of oxygen = 0.03 – 0.15√ ½

2

Total moles = (0.06 + 0.015) √½ = 0.075

Volume of gases = 0.075 √½ x 24 = 1.8dm3 penalize √½ for wrong or missing units

c)(i). White solid √1 turns yellow on heating

the yellow √1 solid turns grey because zinc oxide is reduce to √1 zinc

(ii). ZnO(s) + CO(g) Zn(s) + CO2(g) –penalize √½ for missing/wrong state symbols

Penalize fully if equation is not balanced

7(a)(i) O2- √1

(ii). CuCO3  √1, ZnSO4 √1

(b) Ba2+(aq) + SO42-(aq) BaSO4(s) penalize a chemical

Penalize √½ for missing wrong st. symbols

c). - solution change from blue to colourless/fede√1

- a brown solid is formed √1 mg dissolves

- discharged of Cu2+ because Mg displaced √1Cu2+ from the solution

- Apparatus become worn √½ is exothermic/heat given out

d)(i) Add excess PbO to √½ the HNO3 and filter √½ add soluble sulphate /sulphuric acid to the filtrate. Filter to obtain PbSO4(s) then dry the residue between filter papers

e)(i) determine mpt – if its pure mpt is sharp