3KNT FRATERNITY

CHEMISTRY 233/3

MARKING SCHEME PP3.

|  |  |  |  |
| --- | --- | --- | --- |
| Titration | i | ii | iii |
| Final burette reading $cm^{3}$  | 30.1 | 30.1 | 30.1 |
| Initial burette reading $cm^{3}$ | 0.0 | 0.0 | 0.0 |
| Volume of solution c1 used$cm^{3}$ | 30.1 | 30.1 | 30.1 |

CT-1

D-1

AV-1

FA-1

 05

A)-Complete table 1 mk

 -Consistency use of decimal 1mk

 -penalize fully for mixed decimall

 -Accuracy

If I 0.1 v 1 mk

 Ii 0.25 v ½ mk

 -Principal of averaging

30.1+30.1+30.1=30.1 $cm^{3}$

 3

 - Final answer 1 mk

 -if average titre within ±0.1 of S.V 1mk

b)Mole of NaOH reading

1000$cm^{3}$ 0.2mole ½

25$cm^{3}$=?

$\frac{25}{1000}$ x0.2=0.005 mole

-since the acid in dibiasic,mole ratio of the acid base is 1:2 ie $H\_{2}C\_{2}O\_{4}$x$H\_{2}O\_{4}$:NaoH.

1:2 ½

-This 2moles of NaOH react with one mole of acid

2moles of NaOH 1 mole of acid ½

0.005 moles ?

 =$\frac{0.005}{2}$x1 ½

 =0.0025moles ½

c)if 30.$cm^{3}$ 0.0025moles

1000$cm^{3}$ ? ? ½

 1000x$\frac{0.0025}{30.1}$

 =0.0831 moles/litre ½

d)RMM=g/litre

 molarity

500$cm^{3}$ 5.0 kg ½

1000$cm^{3}$ ?

 =$\frac{1000x5.04}{500}$

 10.0g ½

RMM=$\frac{10.08}{0.0831}$=121 ½

c)$H\_{2}C\_{2}O\_{4}$x$H\_{2}O$=121 ½

90+18x=121

18x=121-90

X=1.7

X=2 ½

2.a)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Total vol of water added to 5g solid k$cm^{3}$ | 10 | 15 | 20 | 25 | 30 | 35 |
| Temperature at which crystals appear ($℃$) | 86 | 67 | 57 | 48.5 | 42 | 39 |
| Solubility of k in g/100g of water. | 50 | 33.3 | 25 | 20 | 16.7 | 14.3 |

i)complete table (column I ) - 2 mks

incomplete table with 5 readings 2 mks

Incomplete table with 4 readings 1 mk

3 and below readings 0 mk

ii)Use of decimals

whole number of idp (applier to column i)

iii)Accuracy ½ mk

I 2.0 0f S.V ½ mk

If otherwise 0mk

iv)Tred ½ mk

½ mk for continous droping temp readings in column iotherwise penalize

Column II 2 mks

½ mk for each value of solubi;lity correctly.

G i)solubility of 25$℃$ 1 mk

From extrapolated graph=8.5g/100g H

ii)Temp when solution will contain 22g

penalize fully for wrong units

d)Mass of solid K 1 mk

At 52$℃=\frac{21.5g}{100g}420$

$At 37℃$ =14.0 g/o$H\_{2}$0

21.5-14.0=7.5 g

|  |  |  |
| --- | --- | --- |
|  | OBSERVATIONS | INFERENCES |
|  a) | Blue green flame ½ | $CU^{2+}$present |
| b i) | White ppt soluble in ½  | $Zn^{2+}Al^{3+}Pb^{2+}$present |
| ii) | White ppt soluble in 1 | $Zn^{2+ }$present ½  |
| iii) | White ppt formed insoluble on warming 1 | $SO\_{4}$ present ½  |
| iv) | White ppt formed insoluble on adding HCL ½  | $SO\_{4}$ present ½ |
| c) | Efferfescence/bubble formed |  |
| d(i) | Burns with a yellow sooty flame ½  |  |
| ii)I | Effervesscence of a colourless gas ½  |  |
| II | Sweet fruity smell |  |
| III | Purple colour of KMnO4 turns colourless 1 |  |