**CHEMISTRY 233/3**

**MARKING SCHEME**

**FORM THREE**

|  |  |  |  |
| --- | --- | --- | --- |
| Titration | 1 | 2 | 3 |
| Final burette reading (cm3) | 21.0 | 21.0 | 21.0 |
| Initial burette reading (cm)3 | 0.0 | 0.0 | 0.0 |
| Volume of solutions used cm3 | 21.0 | 21.0 | 21.0 |

(b) Average volume of solutions S used

Titre 1 + titre 2+ titre 3= ans

3

(c) No of moles of NaOH =titre x 0.5

1000√1

(d) Ratio HCl: NaOH

1:1

∴No. of moles of HCl= ans in c above

(e) No of moles of HCl in 100cm3

Ans in d x 1000cm3= ans

25

(f) Number of moles of HCl in original 60cm3 of solution

60x 1 mole = ans

1000cm3

(g) Number of moles of HCl that reacted

Ans in (f) –Ans in (e) =ans

(h) Mass of sodium sodium carbonate

Ans in g =ans

2

2. Complete table .......2mks (tied to column 1 )

Conditions

Complete table with 4 readings .......2mks

Complete table with 3 readings .......1 1/2 mks

Complete table with 2 readings .......1mks

Complete table with 1 readings .......0mks

N/B Penalize 1/2 mk for each temperature reading above 69.5oC or below 10oC to maximum of 1mk on complete table

Where temperature readings are not continuously dropping

Mark out of 1mk and then subject to the set

Conditions

Reject temperature above 110oC

(b) Use of decimals

Accept only if ALL readings are recorded constitently either as whole numbers of 1dp which must be .0 or .5, otherwise penalize fully. This only applies to colomn 1

(c) Accuracy ...............................1/2 mk

Compare the candidates first temperature ending at 4cm3 with the school value

If within +2oC of the school value........ 1/2 mk

If otherwise..........0mk

(d) Trend..............................................(2mks)

Award 1mk for continous drop in temperature readings in coloumn 1; otherwise penalize fully

(e) Column II.................................................(2mks)

Award 1/2 mk for each value of solubility correctly. Calculated otherwise penalize fully

Accept (a) given as units otherwise fully for any units given

Graph....................................................(3mks)

(a) Labelling of axes .......................( 1/2 mk)

Penalize fully for inversion of axes

Penalize fully for wrong units given, otherwise ignore if units are omitted

Penalize fully if only one axis has been correctly labelled

(b) Scale

Area covered by plots should be at least 3/4 of the plotting space provided

Scale intervals should be consistent

Scale chosen be able to accommodate all the points (plots)

Note: penalize fully if any of the conditions are not met.

(c)Plotting .......1mk

Award 1mk if 3 or 4 points plotted correctly

Award 1/2 mk if only 2 points are correctly plotted

Award 0 mark if only 1 point is correctly plotted

(d) Curve......................................(1mk)

Award 1mk for smooth rising curve joining atleast 3 correctly plotted points, one of which must be at 11.2g i.e value at 4cm3

Reject curve obtained by plotting 2 or more wrongly calculated values in column 11 of the table

(d) Accept the correct reading with or without showing or graph ............................(1mk)

If shown on graph correctly but reading is absent or wrong, award ......................( 1/2mk)

Penalize 1/2 mk for wrong units used, otherwise ignore units.

Reject readings and showing from a wrong graph

3.

|  |  |
| --- | --- |
| (i) Black solid  Green or blue/blue-green flame  (ii) White ppt  Soluble in excess  (iii) White ppt soluble  (iv) White ppt persists on warming  (v) White ppt persists in HCl  (v) Effersence Blue solution | Cu2+  Zn2+, Al3+ or Pb2+  Zn2+ confirmed  SO32-, SO42-  SO42- confirmed  CO32- tied to effervescence  Cu2+ tied to blue solution |

|  |  |
| --- | --- |
| Observations | Inference |
| (i) solid melts lame  Burns with yellow sooty flame/luminous  (ii) Dissolves to for a colourless solution  (iii) PH 4-6  (iv) Decolourizes acidified KMnO4  (v) Effersescence | C = C or C= C  Or R-COOH  present  R-COOH present  Weak acid  R-COOH present  R-COOH  Confirmed |