CHEMISTRY 233/3
TERM 3 2017
MARKING SCHEME
FORM THREE

Titration	1	2	3
Final burette reading (cm^3)	21.0	21.0	21.0
Initial burette reading $(cm)^3$	0.0	0.0	0.0
Volume of solutions used cm^3	21.0	21.0	21.0

(b) Average volume of solutions S used

$\frac{\text{Titre 1 + titre 2+ titre 3}}{3}$ = ans

(c) No of moles of NaOH = $\frac{\text{titre x 0.5}}{1000\sqrt{1}}$

(d) Ratio HCl: NaOH
1:1
∴ No. of moles of HCl= ans in c above
(e) No of moles of HCl in $100cm^3$
$\frac{\text{Ans in d x } 1000cm^3}{25}$ = ans
(f) Number of moles of HCl in original $60cm^3$ of solution
$\frac{60 \text{x } 1 \text{ mole}}{1000cm^3}$ = ans
(g) Number of moles of HCl that reacted
Ans in (f) –Ans in (e) =ans
(h) Mass of sodium sodium carbonate
$\frac{\text{Ans in g}}{2}$ =ans
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 69.5^oC or below 10^oC 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 110^oC
(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 $4cm^3$ with the school value
If within $+2^oC$ 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	Cu^{2+}
(ii) White ppt Soluble in excess	Zn^{2+}, Al^{3+} or Pb^{2+}
(iii) White ppt soluble	Zn^{2+} confirmed
(iv) White ppt persists on warming	SO_3^{2-}, SO_4^{2-}
(v) White ppt persists in HCl	SO_4^{2-} confirmed
(v) Effersence Blue solution	$CO_3$2- tied to effervescence Cu2+ tied to blue solution

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