**233/3 CHEMISTRY PRACTICALS**

**FORM 3 TERM TWO- 2017**

**MARKING SCHEME**

1. TABLE I

CT – 1mark

DP – 1mark

ACC – 1mark

PA – 1mark

FA – 1mark

|  |  |  |
| --- | --- | --- |
| I | II | III |
| Final burette reading (cm3) | 25.0 | 25.1 | 24.9 |
| Initial burette reading (cm3) | 0.0 | 0.0 | 0.0 |
| Volume of acid used (cm3) | 25.0 | 25.1 | 24.9 |

 CT – Complete table with three titrations done and realistic figures filled in

 DP – Consistency in decimal places either 1d.p or 2 d.p used consistently.

 AC – Compare with the school value (SV) if within ± 0.2 award 1mk, other wise award zero

 PA – Values to be averages should be within the range of ± 0.2

 FA – Compare with the school value and check the arithmetic’s.

a) Average volume = (school value (S.V)

b) 0.2moles = 1000cm3

 ✓1 = 0.005moles✓1

c) Mole ratio A : B

 1 : 2✓ ½

 Moles of base = 0.005moles

 Moles of acid = ✓ (½) = 0.0025moles✓ (1)

d) 0.0025moles = average titre

 = 1000cm3

 = ✓1

 = (Correct answer)M✓1

e) RMM = 

 = 10.08 ✓1

 ans in (d)

 = Correct ans✓1

f) (COOH)2. XH2O = 90 + 18X ½

 90 + 18 X = Ans in (e)

 18X = Ans in (e) – 90 ½

 X = Ans in (e) – 90

 18

 X = Correct ans✓1

2. **TABLE II**

|  |  |
| --- | --- |
| Volume of CUSO4 solution used (cm3) | 50.0✓ ½  |
| Highest temperature of the mixture (0C) | 34.5✓ ½  |
| Initial temperature of CUSO4 Sln (0C) | 24.5✓ ½  |
| Change in temperature (0C) | 10.0✓ ½  |

1. 0.2MOLES = 1000cm3

 = 50cm3

 ✓1

 = 0.01moles✓1

1. Δ H = MCθ✓ ½

= ✓ ½

= 2.1kJ✓1 (correct answer)

1. if 0.01moles = 2.1kJ or if answer in (a) = answer (b)

1mole = ✓1 1 mole = 

= -210kJ/mol✓1 (penalize ½ mk for the sign)

 d) To ensure that all the Cu2+ are displaced from the solution ✓1

e) Cu2+(aq) + Zn(s) Cu(s) + Zn2+(aq) ✓ (1) Δ H = -210Kj/mol✓1 or answer in (c)

3. i)

|  |  |
| --- | --- |
| Observation  | Inference  |
| dissolves✓ ½ to form a colourless solution ✓ ½ (reject clear solution) | Presence of Zn2+, Pb2+, Al3+, Mg2+, Ca2+ (ignore absence of coloured ions)5 ions – 1mk 3ions – ½ mk 2 ions 0mk |

ii)

|  |  |
| --- | --- |
| Observation  | Inference  |
| White ppt✓ ½ formed dissolves in excess of NaOH✓ ½  | Zn2+. Pb2+, or Al3+present 3 ions – 1mk 2 ions – ½ mk 1 ions 0mk(penalize ½ mk for contradictory ions to mxm 1mk) |

iii)

|  |  |
| --- | --- |
| Observation  | Inference  |
| White ppt✓ ½ formed insoluble in excess addition of ammonia✓ ½ solution  | Pb2+, Al3+ present 1 ions – 1mk 1 ion – ½ mk (penalize foreign ions) |

iv)

|  |  |
| --- | --- |
| Observation  | Inference  |
| No white ppt.  | Al3+ present ✓1 |

v)

|  |  |
| --- | --- |
| Observation  | Inference  |
| White ppt formed✓1 | SO32-, SO42- or CO32- present 3 ions – 1mk 2 ions – ½ mk1 ion - omk |

vi)

|  |  |
| --- | --- |
| Observation  | Inference  |
| White ppt✓ ½ does not dissolve in nitric✓ ½ (V) acid | SO2-4 present ✓1 |

vii)

|  |  |
| --- | --- |
| Observation  | Inference  |
| White ppt✓ ½  | SO2-4 confirmed present ✓1 |