**30.6.3 Chemistry Paper 3 (233/3)**

**Procedure A**

**Table 1**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Time (min) | 0 | ½ | 1.0 | 1.5 | 1.0 | 2.5 | 3.0 | 3.5 | 4.0 | 4.5 | 5.0 |
| Temperature oC) | 19 | 18.5 | 18.0 | 18.0 | 18.0 | X | 13.0 | 13.0 | 13.5 | 13.5 | 14.0 |

***(5 marks)***

***(3 marks)***

(ii) ΔT = 6oC ***(1 mark)***

(iii) ΔH = 20 × 4.2 × 6

= 504 joules ***(2 marks)***

**Procedure B**

**Table 2**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **I** | **II** | **III** |
| Final burette reading | 16.5 | 32.20 | 32.20 |
| Initial burette reading | 0.0 | 16.0 | 16.0 |
| Titre (cm3) | 16.5 | 16.20 | 16.20 |

***(3 marks)***

(i)  = 16.2 cm3 ***(1 mark)***

(ii)

I  = 0.00162m ***(1 mark)***

II Moles of HCI = Moles of NaOH ***(1 mark)***

= 0.00162

III 0.00162 × 10 = 0.0162m ***(1 mark)***

IV  0.04 ***(1 mark)***

V 0.04-0.00162 = 0.00238 ***(1 mark)***

(c) 0.0238 moles = 504

1 mole = 

= +21.176 kjmol-1 ***(2 marks)***

2.

| ***Observations*** | ***Inferences*** |
| --- | --- |
| (a)   * Green solid turned black. * Colourless liquid condenses on cool part water of crystallization. * Blue litmus paper turned pink. * Red litmus paper remains the same. | * Solid d is hydrated or contains water of crystallization. * Acidic gas is produced   ***(3 marks)*** |
| (b)   * No effervescence. * Black solid reacts to form a green solution. | * Black solid is basic. * Coloured ion present i.e Fe2+orCu2+.   ***(2 marks)*** |
| (c) (i)   * Blue precipitate formed. * Re-dissolves in excess to form a deep. blue/Royal blue solution. | * Cu2+ present.   ***(2 marks)*** |
| (ii)   * Effervescence occurs. * Brown solid deposited. * Colourless formed. * Green solution turns. * Test-tube gets warm. | * E is a metal more reactive than copper or E displaces Copper or E reduces Cu2+ to Cu.   ***(2 marks)*** |
| 3. (a) Yellow smoky flames/sooty flame. | F is along chain hydrocarbon or an unsaturated organic compound. ***(1 mark)*** |
| (b) Dissolves to form a colourless. | It is probably a soluble salt or Polar organic compound. ***(2 marks)*** |
| (c) (i)   * Effervescence occurs. * Colourless gas given out. | Compound is acidic – COOH or H+ or H3O+  ***(2 marks)*** |
| (ii) Orange/Yellow colour persists. | Absence of Hydroxyl group. ***(2 marks)*** |
| (iii) KMnO4(aq) is decoloursied. | C= C or –C≡C- present.  ***(2 marks)*** |