

# MARKING SCHEME MODEL07102022001

1. C T - Complete table (1 mk) (2mks)  
 For correct filling of table (2 mks)  
 Incomplete table penalize ( $\frac{1}{2}$  mks)  
 Inversion penalize ( $\frac{1}{2}$  mks)  
 Unrealistic values (0 mk)
- D - Decimals averaged  
 Use of decimal 2<sup>nd</sup> d.p being 0.05 - (1 mk)  
 Otherwise penalize (1/2 mk).
- Av - Arranging
- consistent values correctly averaged (1/2 mk)  $\pm 0.2$
  - inconvenient values correctly averaged (1/2mk)
  - Wrong arithmetic penalize  $\frac{1}{2}$  mk and a word accordingly
- AC - S.V (School value)
- Any value  $\pm\pm 0.1$  full marks of school value ( 1 mk)
  - Any value  $\pm 0.2$  of s.v (1/2 mk)
  - Any other value (0mk)
- F - Final Answer
- Tied to the averaged value  $\pm\pm 0.1$  of s.v (1mk0)  
 Tied to the averaged value  $\pm 0.2$  (1/2mk)  
 Other (0mk)
- b) (i)  $\frac{\text{Ans in (a)} \times 0.25}{1000} = \text{correct answer}$
- (ii) mole rate of NAOH : HCl  $\approx 1:1$   
 Ans in b (i)
- (iii)  $\frac{\text{Ans in b (ii)} \times 250}{25} = \text{correct answer}$
- (iv)  $\frac{50 \times 0.5}{1000} = 0.025 \text{ moles}$
- (v) Ans in (iv) – Ans in (iii) = correct Ans
- (vi)  $\text{Zn}_{(s)} + 2 \text{HCl}_{(\text{aq})} \longrightarrow \text{ZnCl}_2{}_{(\text{aq})} + \text{H}_2{}_{(\text{g})}$
- Mole ratio of Zn : Hcl  $\approx 1:2$
- Therefore  $\frac{1}{2}$  of Ans in (v)  
 = correct ans.
- (vii) Ans in (vi) x 65
- Correct ans.
2. CT - Complete Table (1mk)  
 Completely filled table (1mk)  
 Unrealistic values ( 0 mk)
- D-Decimals**
- Must be to 1 d.p and 0.0 or 0.5 (1 mk)

Otherwise penalize (1/2)

### Tr - Trend

Increasing values up to end point, then decreasing values (1mk)

Otherwise (0mk)

### AC - Accuracy

Any value within  $\pm 0.5$  ( 1mk) of S.V)

Otherwise penalize ((1/2mk)

### (a) Scale

All axes correctly labeled (1 mk) otherwise penalize (1/2 mk)

Graph must cover at least  $\frac{3}{4}$  of both axes otherwise penalize  $\frac{1}{2}$ .

Consistent scale (1mk) otherwise (0)

### P - Plot

At least  $\frac{3}{4}$  of table values correctly plotted (1mk) otherwise award (0mk)

Straight line graph joining the points for rising temperature and decreasing temperature (1mk)

- Penalize (1/2mks) for direct joining without extrapolation

(b)(i) From the graph (extrapolated)

- Extrapolated value only . (1 mk)

Correct Ans

$$\frac{1 \times \text{correct ans}}{0.04 \times 2}$$

$\approx$  correct Ans.

3.(a) **observation**

N dissolves to form a colourless  
Solution

### inferences

$\text{Cu}^{st}_{(aq)}$ ,  $\text{Fe}^{2+}_{(aq)}$ ,  $\text{Fe}^{3+}_{(aq)}$

Absent

OR

$\text{Na}^+_{(aq)}$ ,  $\text{K}^+_{(aq)}$ ,  $\text{NH}_4^+_{(aq)}$  present.

$\text{Na}^+_{(aq)}$ ,  $\text{K}^+_{(aq)}$ ,  $\text{NH}_4^+_{(aq)}$

present

Or

$\text{Al}^{3+}_{(aq)}$ ,  $\text{Zn}^{2+}_{(aq)}$ ,  $\text{pb}^{2+}_{(aq)}$  Absent

All three - 1 mk

Only 2 -  $\frac{1}{2}$  mk

Only 1 - (0 mk)

$\text{SO}^{2-}_{3(aq)}$ ,  $\text{CO}^{2-}_{3(aq)}$ ,  $\text{SO}^{2-}_{4(aq)}$ ,  $\text{Cl}^-_{(aq)}$

Present

All - 4 = 1 mk

Only 2-3 -  $\frac{1}{2}$  mks

One - 0

$\text{SO}^{2-}_{3, (aq)}$ ,  $\text{CO}^{2-}_{3}$

present all two - 1 mk (must be in (iii) above  
one - 0 mk.

$\text{SO}^{2-}_{3, (aq)}$

Confirmed present. Must be in (iv)

(ii) White precipitate formed

Rj - White solution

iv A white precipitate formed which dissolved on adding Hcl

v) Dischromate changes from Orange to green

- b) (i) No white precipitate formed  
 RJ :- Clear solution  
 - No precipitate  
 - No observable change
- Zn<sup>2+</sup><sub>(aq)</sub>, Al<sup>3+</sup><sub>(aq)</sub>, Pb<sup>2+</sup><sub>(AQ)</sub>. absent  
 RJ: Ba<sup>2+</sup>, absent  
 -Na<sup>+</sup>, K<sup>+</sup>, NH<sup>+</sup><sub>4</sub> mention as absent.  
 2 - 3 ions - ½ mk  
 Only one - 0 mk
- (ii) No white precipitate formed  
 RJ -Change  
 - no reaction  
 - no observable change
- SO<sup>2-</sup><sub>4 (aq)</sub>, CO<sup>2-</sup><sub>3 (aq)</sub>, SO<sup>2-</sup><sub>3</sub> absent  
 2 - 3 ions - ½ mk  
 only 1 ion - 0 mk
- (iii) Brown solution  
 Black precipitate
- I<sup>-</sup><sub>(aq)</sub> present  
 N.B penalize fully if contradictory ion is Mentioned
- (iv) Bright yellow precipitate  
 Formed
- I<sup>-</sup><sub>(aq)</sub> confirmed present  
 NB penalize fully For any contradictory