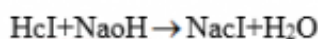


1. -Complete table -CT 1 mk
 - Decimal -D 1 mk
 - Accuracy -A 1 mk
 - Principal of average PA 1 mk
 - Final Answer FA 1 mk
- 05 mks
Complete table mark.
Award this mark if the following conditions are met:
- i. Complete table with 3 titre values 1 mk
 - ii. Incomplete table with 2 titrations $\frac{1}{2}$ mk
 - iii. Incomplete table with 1 titration 0 mk
- Penalties
- Wrong arithmetic.
- Inverted table.
- Burette reading greater than 50 unless explained.
NB penalties $\frac{1}{2}$ mk for each of these penalties to a maximum of $\frac{1}{2}$ mk.
- Accuracy mark
- If one titre value is within 1 mk
 - If one titre value value is within 0.2 of sch value $\frac{1}{2}$ mk
 - If no titre value is within 0.2 of sch value 0 mk
- Principals of averaging
- i. If 3 consistent values are averaged 1 mk
 - ii. If 3 titrations are done and only 2 are consistent and averaged 1 mk
 - iii. If 2 titrations are done and are consistent and are averaged. 1 mk
 - iv. If 3 or 2 titrations are done and are inconsistent and are averaged. 0 mk
 - v. If 3 titrations are done are consistent and only 2 are averaged 0 mk
 - vi. If one titration is done
- 0 mk
- Penalties
- i. Penalise $\frac{1}{2}$ mk for wrong arithmetic.
 - ii. Penalise $\frac{1}{2}$ mk if no working is shown but answer given is correct.
 - iii. Penalise $\frac{1}{2}$ mk if answer given is in less than 2 d.p
 - iv If wrong units are used penalize $\frac{1}{2}$ mk

Final answer

- i. If within ± 0.10 of school value 1 mk
 ii. If not within ± 0.10 but with 0.2 $\frac{1}{2}$ mk
 iii. If beyond ± 0.2 of s.v 0 mk

b) Moles of NaOH used $\frac{0.4 \times 20}{1000} = 0.008$ Moles $\frac{1}{2}$



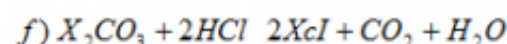
Ratio $1:1$ $\frac{1}{2}$ mk

Moles of sol. B = 0.008 moles $\frac{1}{2}$ mk

c) $\frac{250 \times \text{Answer in (b)}}{25} = \text{Ans}$ $\frac{1}{2}$ mk

d) $\frac{50 \times 2}{1000} = \text{Ans}$ $\frac{1}{2}$ mk 1mk

e) Answer in (d) - Answer in (c) = Ans 1mk



Ratio 1: 2 $\frac{1}{2}$ mk

Moles of X_2CO_3 - $\frac{1}{2} \times \text{Answer in (e)} = \text{Ans}$ $\frac{1}{2}$ mk

g) $1 \times 1.06 = \text{Ans}$ $\frac{1}{2}$ mk

Answer in f

$\text{X}_2\text{CO}_3 = \text{Ans}$ $\frac{1}{2}$ mk

$2x + 12 + (16 \times 3) = \text{Ans X}$

$2x = \text{Ans} - 60$

$X = \frac{\text{Ans} - 60}{2} = \text{Ans}$ $\frac{1}{2}$ mk

2.

Table
CT-2mks
D-1mk
T-1mk

Complete table mark CT

- I) Complete table with 8 value -2mks
- II) Incomplete table with 5-7 values -1 ½ mk
- III) Incomplete table with 4 values - 1mk
- IV) Incomplete table with 2 – 3 values - ½ mk
- V) Incomplete table with less than 2 values – 0mk

TREND

The values should increase gradually then fall.

Decimal mark –D

One d.p should be used consistently.

- a) Graph
- b) Scale – s- 1mk
- c) Plotting – p -1mk
- d) Curve –c- 1mk
- e) Labeling -1 -1mk

Scale

- i) Should be uniform with equal intervals
- ii) The actual plots should occupy atleast half of the grids provided. Other w ise penalize fully.

Plotting

- i) 6-8 points plotted correctly -1mk
- ii) 4 -5 points plotted correctly - ½ mk
- iii) Less than 4 points plotted correctly – 0mk

Curve

- Should be two straight lines passing through majority of points for
- 1mk. Otherwise penalize fully.

3.

Labelling

- (i) The two axes should be labeled correctly with correct units for **1 mk**
 (ii) If one axis is labeled correctly **½ mk**
 (iii) If all axes are wrongly labeled **0 mk**
 (iv) If the axes are inverted **0mk**

b) 22.0 ± 1 **mk**

c) 18.5 ± 1 **mk**

Extrapolating the graph **½ mk**

d) Highest temp - Initial temp = Ans **½mk**

(extrapolate the 2 lines)

NB: Answer should be within the range of 5-6°C otherwise penalize fully.

Heat evolved = $52.0 \times 4.2 \times 5.5$ **½ mk**

970.2 J **½ mk**

Moles of NaOH used = $\frac{20 \times 1}{1000} = 0.02 \text{ moles}$ **½mk**

$0.02 \text{ moles} \rightarrow 970.2 \text{ J}$

$1 \text{ mole} = \frac{1 \times 970.2}{0.02} = 48510 \text{ J}$

Heat of reaction = 48.51 KJ/mol .

Observation	Inferences
a) - Colourless liquid condenses on cooler parts of Test tube - (½ mk) - Colourless gas that turns moist red litmus paper Blue (½ mk)	- Hydrated salt (½ mk) Basic gas produced (½ mk)
b) Pale green solution formed (1 mk)	Fe^{2+} present (1 mk)
c) Green ppt (½mk) Insoluble (½mk) in excess ammonia	Fe^{2+} present (1 mk)
d) White ppt (1mk)	Cl^- , SO_4^{2-} , SO_3^{2-} or CO_3^{2-} Present (1mk) - 4 ions 1 mk - 3 ions (½ mk) - less than 3 (0 mk)
White ppt (1 mk)	SO_3^{2-} Present (1 mk)