



OR Alternatively

250cm³ of solution BA1 contain 1g of NaOH

$$\therefore 1000\text{cm}^3 \text{ of solution BA1 contain } \frac{1 \times 1000}{250} = 4\text{g of NaOH}$$

40g is mass of 1 mole of NaOH

$$\therefore 4\text{g is mass of } \frac{1 \times 4}{40} = 0.1 \text{ moles of NaOH in } 1000\text{cm}^3$$

1000cm³ of solution BA1 contain 0.1 mole

$$\Rightarrow 25\text{cm}^3 \text{ of solution BA1 contain } \frac{0.1 \times 25}{1000} = 2.5 \times 10^{-3} \text{ moles of NaOH}$$

(ii) 98g of mass of 1 mole of H_nX

$$4.9\text{g is mass of } \frac{1 \times 4.9}{98} = 0.05 \text{ moles of } H_nX \text{ in } 1\text{dm}^3$$

1000cm³ of solution BA2 contain 0.05 moles of H_nX

$$\therefore 16.7\text{cm}^3 \text{ of solution BA2 contain } \frac{0.05 \times 16.7}{1000} = 8.35 \times 10^{-4}$$

(b) H_nX

NaOH

1

n

Moles

$$8.35 \times 10^{-4}$$

:

$$2.5 \times 10^{-3}$$

Mole ratio

$$\frac{8.35 \times 10^{-4}}{8.35 \times 10^{-4}}$$

:

$$\frac{2.5 \times 10^{-3}}{8.35 \times 10^{-4}}$$

1

:

3

$$\Rightarrow n = 3$$



OBSERVATIONS

DEDUCTIONS

(a) <ul style="list-style-type: none"> - White solid - Colourless gas turns moist blue litmus red and limewater milky - Residue is Reddish brown or orange (hot) and yellow (cold) 	$CO_{2(g)} \therefore CO_3^{2-} / HCO_3^-$ $PbO \therefore Pb^{2+}$
(b) <ul style="list-style-type: none"> - Effervescence or bubbles of a colourless gas turns moist blue litmus red and lime water milky - Colourless solution 	$CO_{2(g)} \therefore CO_3^{2-}$ Probably Al^{3+} or Zn^{2+} or Pb^{2+} or Mg^{2+}
(c) <ul style="list-style-type: none"> - White ppt insoluble in excess - White residue - Colourless filtrate 	Probably Ca^{2+} or Mg^{2+} Probably Al^{3+} or Pb^{2+} or Zn^{2+}
(d) White ppt soluble in acid	Probably Al^{3+} or Pb^{2+} or Zn^{2+}
(i) White ppt soluble in excess giving a colourless solution	Probably Al^{3+} or Pb^{2+} or Zn^{2+}
(ii) White ppt insoluble in ammonia	Probably Al^{3+} or Pb^{2+}
(iii) White ppt	Pb^{2+} present
(iv) On addition of potassium iodide solution / $KI_{(aq)}$ gives a yellow ppt	Pb^{2+}
(e) Colourless solution	Probably Ca^{2+} or Mg^{2+}
(i) White ppt insoluble	Probably Ca^{2+} or Mg^{2+}
(ii) No white ppt or No observable change	Ca^{2+} absent $\therefore Mg^{2+}$ present
(iii) White ppt insoluble	Mg^{2+} present

(f) (i) Cations in Q are Pb^{2+} and Mg^{2+}

(ii) anions in Q is CO_3^{2-}

END

 $1\frac{1}{2}$

025