

1

	CaCl ₂	Ba(NO ₃) ₂	Na ₂ CO ₃	Na ₂ SO ₄	Pb(NO ₃) ₂
CaCl ₂		-	CaCO ₃ ↓	CaSO ₄ ↓	PbCl ₂ ↓
Ba(NO ₃) ₂	-		BaCO ₃ ↓	BaSO ₄ ↓	-
Na ₂ CO ₃	CaCO ₃ ↓	BaCO ₃ ↓		-	PbCO ₃ ↓
Na ₂ SO ₄	CaSO ₄ ↓	BaSO ₄ ↓	-		PbSO ₄ ↓
Pb(NO ₃) ₂	PbCl ₂ ↓	-	PbCO ₃ ↓	PbSO ₄ ↓	

(3) (5)

Na₂SO₄ Na₂CO₃,

2 5.

(6) CaSO₄

Na₂SO₄ - 2, Na₂CO₃ - 5, CaCl₂ -

4.

CaCl₂ Pb(NO₃)₂ PbCl₂,

3

Pb(NO₃)₂.

1 - Ba(NO₃)₂, 2 - Na₂SO₄, 3 - Pb(NO₃)₂, 4 - CaCl₂, 5 - Na₂CO₃.

- 1) CaCl₂ + Na₂CO₃ → CaCO₃↓ + 2NaCl;
- 2) CaCl₂ + Na₂SO₄ → CaSO₄↓ + 2NaCl;
- 3) CaCl₂ + Pb(NO₃)₂ → PbCl₂↓ + 2Ca(NO₃)₂;
- 4) Ba(NO₃)₂ + Na₂CO₃ → BaCO₃↓ + 2NaNO₃;
- 5) Ba(NO₃)₂ + Na₂SO₄ → BaSO₄↓ + 2NaNO₃;
- 6) Na₂CO₃ + Pb(NO₃)₂ → PbCO₃↓ + 2NaNO₃;
- 7) Na₂SO₄ + Pb(NO₃)₂ → PbSO₄↓ + 2NaNO₃.

: 1 - Ba(NO₃)₂, 2 - Na₂SO₄, 3 - Pb(NO₃)₂, 4 - CaCl₂, 5 - Na₂CO₃

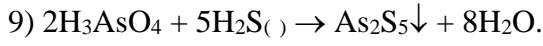
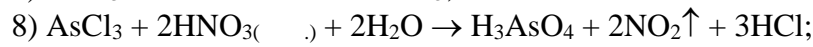
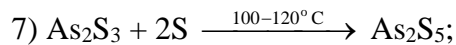
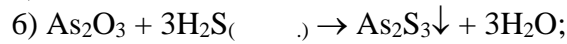
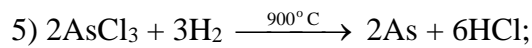
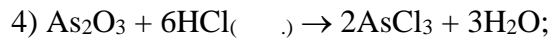
: (15)

() - 3 ,

- 5 () - 7 . 1) ;

2

- 1) 2As + 5F₂ → 2AsF₅;
- 2) AsF₅ + 8NaOH() → Na₃AsO₄ + 5NaF + 4H₂O;



: (20)

1, 5 (1), 4, 7 (1.5)

-5 ;

2, 3, 6, 8, 9 (3) - 15 .

3

$$m_1(\text{Na}_3\text{PO}_4) = \frac{\check{S}_1(\text{Na}_3\text{PO}_4) \cdot m_1(\quad)}{100\%} = \frac{5\% \cdot 200}{100\%} = 10(\quad).$$

$$m_2(\quad) = 200 + 10 = 210(\quad).$$

$$m_2(\text{Na}_3\text{PO}_4) = \frac{\check{S}_2(\text{Na}_3\text{PO}_4) \cdot m_2(\quad)}{100\%} = \frac{6.82\% \cdot 210}{100\%} = 14.32(\quad).$$

$$m(\text{Na}_3\text{PO}_4) = 14.32 - 10 = 4.32(\quad).$$

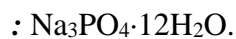
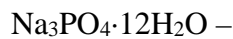
$$m(\text{H}_2\text{O}) = 10 - 4.32 = 5.68(\quad).$$

$$\frac{(164+18)}{10}$$

$$= 12. \text{C}$$

$$\frac{18}{5.68}$$

$$- \text{Na}_3\text{PO}_4 \cdot 12\text{H}_2\text{O}.$$



: (10)

- 1.5 ;

- 0.5 ;

- 1.5 ;

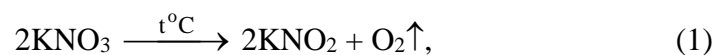
- 0.5 ;
- 0.5 ;

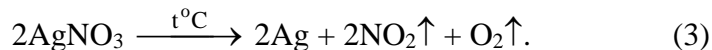
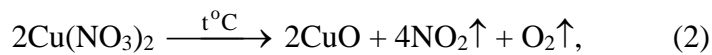
3.5 ;

- 2 .

4

1.





2.

(KNO₂). (3.4)

),

$$(1) \quad \begin{array}{l} \text{KNO}_3 \quad 101 / , \quad \text{KNO}_2 - 85 \\ : \\ 2 \cdot 101 \text{ KNO}_3 \quad 2 \cdot 85 \text{ KNO}_2, \\ \text{KNO}_3 \quad 3 \cdot 4 \text{ KNO}_2, \\ = 4.04 ; \end{array}$$

$$\begin{array}{l} 2 \cdot 101 \text{ KNO}_3 \quad 22.4 \text{ O}_2, \\ 4.04 \text{ KNO}_3 \quad \text{O}_2, \\ = 0.448 . \end{array}$$

$$\text{KNO}_3 \quad 4.04 , \quad (4.04/18.36) \cdot 100\% = 22\%.$$

3.

$$3.584 \quad (4.032 - 0.448). \quad z \quad \text{Cu}(\text{NO}_3)_2. \quad 14.32 \quad (18.36 - 4.04)$$

$$\text{AgNO}_3 - 170 / \quad \text{Cu}(\text{NO}_3)_2 \quad 188 / , \quad -$$

$$\begin{array}{l} 2 \cdot 188 \text{ Cu}(\text{NO}_3)_2 \quad 5 \cdot 22.4 \quad \text{NO}_2 \quad \text{O}_2, \\ z \text{ Cu}(\text{NO}_3)_2 \quad \text{NO}_2 \quad \text{O}_2, \\ = 0.298 \cdot z \quad \text{NO}_2 \quad \text{O}_2; \end{array}$$

$$\begin{array}{l} 2 \cdot 170 \text{ AgNO}_3 \quad 3 \cdot 22.4 \quad \text{NO}_2 \quad \text{O}_2, \\ (14.32 - z) \text{ AgNO}_3 \quad \text{NO}_2 \quad \text{O}_2, \\ = 0.198 \cdot (14.32 - z) \quad \text{NO}_2 \quad \text{O}_2. \end{array}$$

:

$$+ = 3.584 \quad 0.298 \cdot z + 0.198 \cdot (14.32 - z) = 3.584, \quad z = 7.49 .$$

$$(7.49/18.36) \cdot 100\% = 40.8\%.$$

4.

$$\text{AgNO}_3 \quad 14.32 - 7.49 = 6.83 . \quad (6.83/18.36) \cdot 100\% = 37.2\%.$$

$$37.2\%, \quad \text{KNO}_3, \text{Cu}(\text{NO}_3)_2 \quad \text{AgNO}_3 \quad 22\%, 40.8\%$$

:(15)

$$(1)-(2) (\quad 2 \quad) - 6 \quad ;$$

$$\text{KNO}_3 - 4 \quad ;$$

$$\text{Cu}(\text{NO}_3)_2 - 4 \quad ;$$

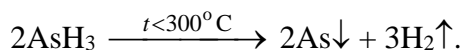
$$\text{AgNO}_3 - 1 \quad .$$

5

:

1.

$$1.5x$$



2.

:

$$\alpha = \frac{n_{\text{AsH}_3}}{n_{\text{AsH}_3}}$$

3. $n_{\text{AsH}_3} - n_{\text{AsH}_3} = \text{AsH}_3$ ()

$$n_{\text{AsH}_3} = \frac{pV_1}{RT}$$

4. AsH_3 1.5 2. (n_{AsH_3}) (.) -

$$n_{\text{AsH}_3} + n_{\text{H}_2} = \frac{pV_2}{RT}$$

$$n_{\text{H}_2} = 1.5, \quad n_{\text{AsH}_3} = n_{\text{AsH}_3} -$$

$$n_{\text{AsH}_3} + n_{\text{H}_2} = n_{\text{AsH}_3} - + 1.5 = \frac{pV_2}{RT}$$

$$(n_{\text{AsH}_3} + n_{\text{H}_2}) - n_{\text{AsH}_3} = \frac{pV_2}{RT} - \frac{pV_1}{RT} = \frac{p(V_2 - V_1)}{RT}$$

$$n_{\text{AsH}_3} - + 1.5 - n_{\text{AsH}_3} = \frac{p(V_2 - V_1)}{RT}$$

$$0.5 = \frac{p(V_2 - V_1)}{RT}, \quad = \frac{2p(V_2 - V_1)}{RT}$$

$$n_{\text{AsH}_3} = n_{\text{AsH}_3} - = \frac{pV_1}{RT} - \frac{2p(V_2 - V_1)}{RT} = \frac{p(3V_1 - 2V_2)}{RT}$$

5. α :

$$\alpha = \frac{n_{\text{AsH}_3}}{n_{\text{AsH}_3}} = \frac{p(3V_1 - 2V_2)}{RT} / \frac{pV_1}{RT} = \frac{3V_1 - 2V_2}{V_1} = \frac{3 \cdot 50 - 2 \cdot 62}{50} = \frac{150 - 124}{50} = 0.52$$

: $\alpha = 0.52$ (52%).

: (15)

$$\begin{aligned} & \text{AsH}_3 - 2 ; \\ & (\alpha) - 3 ; \\ & \text{AsH}_3 - 2 ; \\ & \text{AsH}_3 (n_{\text{AsH}_3}) - 7 ; \\ & (\alpha) - 1 . \end{aligned}$$

- 1) $(\text{NH}_4)_2\text{CO}_3 \xrightarrow{t^\circ\text{C}} 2\text{NH}_3 + \text{CO}_2 + \text{H}_2\text{O}$ ((503));
- 2) $\text{NH}_4\text{HCO}_3 \xrightarrow{t^\circ\text{C}} \text{NH}_3 + \text{CO}_2 + \text{H}_2\text{O}$;
- 3) $\text{NH}_4\text{NO}_3 \xrightarrow{t^\circ\text{C}} \text{N}_2\text{O} + 2\text{H}_2\text{O}$ (N_2O);
- 4) $\text{NH}_4\text{NO}_2 \xrightarrow{t^\circ\text{C}} \text{N}_2 + 2\text{H}_2\text{O}$;
- 5) $\text{NH}_4\text{F} \xrightarrow{t^\circ\text{C}} \text{NH}_3 + \text{HF}$;
- 6) $\text{NH}_4\text{Cl} \xrightarrow{t^\circ\text{C}} \text{NH}_3 + \text{HCl}$;
- 7) $\text{NH}_4\text{Br} \xrightarrow{t^\circ\text{C}} \text{NH}_3 + \text{HBr}$;
- 8) $\text{NH}_4\text{I} \xrightarrow{t^\circ\text{C}} \text{NH}_3 + \text{HI}$;
- 9) $(\text{NH}_4)_2\text{S} \xrightarrow{t^\circ\text{C}} 2\text{NH}_3 + \text{H}_2\text{S}$;
- 10) $\text{NH}_4\text{HS} \xrightarrow{t^\circ\text{C}} \text{NH}_3 + \text{H}_2\text{S}$;
- 11) $2\text{NH}_4\text{ClO}_4 \xrightarrow{t^\circ\text{C}} \text{N}_2 + \text{Cl}_2 + 2\text{O}_2 + 4\text{H}_2\text{O}$ ();
- 12) $2\text{NH}_4\text{ClO}_3 \xrightarrow{t^\circ\text{C}} \text{N}_2 + \text{Cl}_2 + \text{O}_2 + 4\text{H}_2\text{O}$;
- 13) $(\text{NH}_4)_2\text{SO}_3 \xrightarrow{t^\circ\text{C}} 2\text{NH}_3 + \text{SO}_2 + \text{H}_2\text{O}$;
- 14) $\text{NH}_4\text{CN} \xrightarrow{t^\circ\text{C}} \text{NH}_3 + \text{HCN}$.

: (15)

1 - 12 ;

() - 3 .