Identifying and Balancing Chemical Reactions

Identify the type of reaction occurring in each of the following equations and then balance the equations.

(i)
$$Na_2CO_3 + HCI \rightarrow NaCI + H_2CO_3$$

Type of reaction:

(ii)
$$NH_4NO_2 \rightarrow N_2 + H_2O$$

Type of reaction:

(iii)
$$N_2 + O_2 \rightarrow N_2O_5$$

Type of reaction:

(iv)
$$MgCO_3 \rightarrow MgO + CO_2$$

Type of reaction:

(v) KBr +
$$Cl_2 \rightarrow KCl + Br_2$$

Type of reaction:

(vi)
$$Zn + CuSO_4 \rightarrow Cu + ZnSO_4$$

Type of reaction:

(vii)
$$P + O_2 \rightarrow P_4O_6$$

Type of reaction:

(viii)
$$SrBr_2 + (NH_4)_2CO_3 \rightarrow SrCO_3 + NH_4Br$$
 Type of reaction:

(ix)
$$AgNO_3 + (NH_4)_2CrO_4 \rightarrow Ag_2CrO_4 + NH_4NO_3$$
 Type of reaction:

$$(x)$$
 K + $H_2O \rightarrow KOH + H_2$

Type of reaction:

(xi) Al + Pb₂(NO₃)₂
$$\rightarrow$$
 Al(NO₃)₃ + Pb

Type of reaction:

(xii) Fe +
$$O_2 \rightarrow Fe_3O_4$$

Type of reaction:

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Answers

(i)
$$1 \text{ Na}_2\text{CO}_3 + 2 \text{ HCl} \rightarrow 2 \text{ NaCl} + 1 \text{ H}_2\text{CO}_3$$

Type of reaction: Double Replacement

(ii)
$$1 \text{ NH}_4 \text{NO}_2 \rightarrow 1 \text{ N}_2 + 2 \text{ H}_2 \text{O}$$

Type of reaction: Decomposition

(iii)
2
 N $_2$ + 5 O $_2$ \rightarrow 2 N $_2$ O $_5$

Type of reaction: Synthesis

(iv)
$$1 \text{MgCO}_3 \rightarrow 1 \text{MgO} + 1 \text{CO}_2$$

Type of reaction: Decomposition

(v)
2
 KBr + 1 Cl ${}_{2}$ \longrightarrow 2 KCl + 1 Br ${}_{2}$

Type of reaction: Single Replacement

(vi)
$$\frac{1}{2}$$
 Zn + $\frac{1}{2}$ CuSO₄ \rightarrow $\frac{1}{2}$ Cu + $\frac{1}{2}$ ZnSO₄

Type of reaction: Single Replacement

(vii)
4
 P + 3 O $_2$ \longrightarrow 1 P $_4$ O $_6$

Type of reaction: Single replacement

(viii)
$$1 \operatorname{SrBr}_2 + 1 (\operatorname{NH}_4)_2 \operatorname{CO}_3 \rightarrow 1 \operatorname{SrCO}_3 + 2 \operatorname{NH}_4 \operatorname{Br}$$

Type of reaction: Double Replacement

(ix) 2 AgNO₃ + 1 (NH₄)₂CrO₄
$$\rightarrow$$
 1 Ag₂CrO₄ + 2 NH₄NO₃ Type of reaction: Double Replacement

$$(x)$$
 2 K + 2 H₂O \Rightarrow 2 KOH + 1 H₂

Type of reaction: Single Replacement

(xi) 2 AI + 3 Pb₂(NO₃)₂
$$\rightarrow$$
 2 AI(NO₃)₃ + 3 Pb

Type of reaction: Single Replacement

(xii) 3 Fe + 2
$$O_2 \rightarrow 1$$
 Fe₃ O_4

Type of reaction: Synthesis