## Identifying and Balancing Chemical Reactions

Determine the reaction type for each of the following reactions and balance them.

(1) 
$$AgNO_3 + Cu \rightarrow CuNO_3 + Ag$$

Type of reaction:

(2) NaCl 
$$\rightarrow$$
 Na + Cl<sub>2</sub>

Type of reaction:

(3) 
$$N_2 + H_2 \rightarrow NH_3$$

Type of reaction:

(4) 
$$HCI + FeS \rightarrow FeCl_2 + H_2S$$

Type of reaction:

(5) Fe + 
$$CuSO_4 \rightarrow FeSO_4 + Cu$$

Type of reaction:

(6) 
$$P_4O_{10} + H_2O \rightarrow H_3PO_4$$

Type of reaction:

(7) Fe + 
$$H_2O \rightarrow Fe_3O_4 + H_2$$

Type of reaction:

(8) 
$$H_3PO_4 \rightarrow H_4P_2O_7 + H_2O$$

Type of reaction:

(9) 
$$Fe_2O_3 + C \rightarrow CO + Fe$$

Type of reaction:

(10) Fe + 
$$O_2 \rightarrow Fe_2O_3$$

Type of reaction:

(11) 
$$C_{10}H_{16} + CI_2 \rightarrow C + HCI$$

Type of reaction:

(12) 
$$HCl + AgNO_3 \rightarrow HNO_3 + AgCl$$
 Type of reaction:

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## **Answers**

(1) 
$$\frac{1}{1}$$
 AgNO<sub>3</sub> +  $\frac{1}{1}$  Cu  $\rightarrow$   $\frac{1}{1}$  CuNO<sub>3</sub> +  $\frac{1}{1}$  Ag

Type of reaction: Single replacement

(2) 2 NaCl 
$$\rightarrow$$
 2 Na + 1 Cl<sub>2</sub>

Type of reaction: **Decomposition** 

(3) 
$${}^{1}\text{N}_{2} + {}^{3}\text{H}_{2} \rightarrow {}^{2}\text{NH}_{3}$$

Type of reaction: Synthesis

(4) 2 HCl + 1 FeS 
$$\rightarrow$$
 1 FeCl<sub>2</sub> + 1 H<sub>2</sub>S

Type of reaction: Double replacement

(5) 1 Fe + 1 CuSO<sub>4</sub> 
$$\rightarrow$$
 1 FeSO<sub>4</sub> + 1 Cu

Type of reaction: Single replacement

(6) 
$$1 P_4 O_{10} + 6 H_2 O \rightarrow 4 H_3 PO_4$$

Type of reaction: Synthesis

(7) 3 Fe + 4 H<sub>2</sub>O 
$$\rightarrow$$
 1 Fe<sub>3</sub>O<sub>4</sub> + 4 H<sub>2</sub>

Type of reaction: Single replacement

(8) 
$$^{2}$$
  $^{2}$   $^{1}$   $^{2}$   $^{2}$   $^{2}$   $^{3}$   $^{2}$   $^{2}$   $^{3}$   $^{2}$   $^{3}$   $^{2}$   $^{3$ 

Type of reaction: Decomposition

(9) 
$$1 \operatorname{Fe_2O_3} + 3 \operatorname{C} \rightarrow 3 \operatorname{CO} + 2 \operatorname{Fe}$$

Type of reaction: Single replacement

(10) 4 Fe + 
$$\frac{3}{3}$$
 O<sub>2</sub>  $\rightarrow$  2 Fe<sub>2</sub>O<sub>3</sub>

Type of reaction: Synthesis

(11) 
$${}^{1}_{10}H_{16} + {}^{8}_{10}CI_{2} \rightarrow {}^{10}_{10}C + {}^{16}_{10}HCI$$

Type of reaction: Single replacement

(12) 
$$\frac{1}{1}$$
 HCl +  $\frac{1}{1}$  AgNO<sub>3</sub>  $\rightarrow$   $\frac{1}{1}$  HNO<sub>3</sub> +  $\frac{1}{1}$  AgCl

Type of reaction: Double replacement