

Chemical Reactions

Balance the following chemical equations.

1. $\text{SnS}_2(\text{s}) + \text{O}_2(\text{g}) \rightarrow \text{SnO}_2(\text{s}) + \text{SO}_2(\text{g})$
2. $\text{C}_2\text{H}_6(\text{g}) + \text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{g})$
3. $\text{Al}(\text{s}) + \text{HCl}(\text{aq}) \rightarrow \text{AlCl}_3(\text{aq}) + \text{H}_2(\text{g})$
4. $\text{CoCO}_3(\text{s}) \rightarrow \text{CoO}(\text{s}) + \text{CO}_2(\text{g})$

Write a balanced equation for each of the following reactions, substituting symbols and formulas for names. Include the state of each reactant and product. Then identify the reaction type for each. If more than one reaction type applies, list all that apply.

5. When aluminum nitrate and sodium hydroxide solutions are mixed, solid aluminum hydroxide forms. The other product is sodium nitrate.
6. When magnesium is heated in the presence of nitrogen gas, solid magnesium nitride forms.
7. When solid copper(II) oxide and hydrogen react, metallic copper and water form.
8. Most industrial production of metallic sodium is accomplished by passing an electric current through molten sodium chloride. Chlorine gas also is produced.
9. Liquid pentane (C_5H_{12}) burns, producing water vapor and carbon dioxide.

10. When chlorine gas is passed through a potassium bromide solution, bromine forms in a potassium chloride solution.
11. Magnesium burns in air to form magnesium oxide.

Predict the products in each of the following reactions. If no reaction occurs, write *NR*. You may use Figure 10-10 for the relative activities of common metals and halogens.

12. $\text{Rb}(\text{s}) + \text{CaCl}_2(\text{aq})$
13. $\text{Pt}(\text{s}) + \text{MnBr}_2(\text{aq})$
14. $\text{F}_2(\text{g}) + \text{NaI}(\text{aq})$
15. $\text{Zn}(\text{s}) + \text{AgNO}_3(\text{aq})$

Write a complete ionic equation and a net ionic equation for each of the following double-displacement reactions.

16. $\text{Ba}(\text{NO}_3)_2(\text{aq}) + \text{H}_2\text{SO}_4(\text{aq}) \rightarrow \text{BaSO}_4(\text{s}) + 2\text{HNO}_3(\text{aq})$
17. $\text{FeCl}_3(\text{aq}) + (\text{NH}_4)_3\text{PO}_4(\text{aq}) \rightarrow \text{FePO}_4(\text{s}) + 3\text{NH}_4\text{Cl}(\text{aq})$
18. $\text{KCl}(\text{aq}) + \text{AgC}_2\text{H}_3\text{O}_2(\text{aq}) \rightarrow \text{AgCl}(\text{s}) + \text{KC}_2\text{H}_3\text{O}_2(\text{aq})$