

## Section 4.3 Chemical Equations

### Comprehension

#### Balancing equations

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- $\text{H}_2 + \text{F}_2 \rightarrow 2 \text{HF}$
- $2 \text{Sn} + \text{O}_2 \rightarrow 2 \text{SnO}$
- $\text{MgCl}_2 \rightarrow \text{Mg} + \text{Cl}_2$
- $2 \text{KNO}_3 \rightarrow 2 \text{KNO}_2 + \text{O}_2$
- $2 \text{BN} + 3 \text{F}_2 \rightarrow 2 \text{BF}_3 + \text{N}_2$
- $\text{CuI}_2 + \text{Fe} \rightarrow \text{FeI}_2 + \text{Cu}$
- $2 \text{Li} + 2 \text{H}_2\text{O} \rightarrow 2 \text{LiOH} + \text{H}_2$
- $4 \text{NH}_3 + 3 \text{O}_2 \rightarrow 2 \text{N}_2 + 6 \text{H}_2\text{O}$
- $\text{V}_2\text{O}_5 + 5 \text{Ca} \rightarrow 5 \text{CaO} + 2 \text{V}$
- $2 \text{C}_9\text{H}_6\text{O}_4 + 17 \text{O}_2 \rightarrow 18 \text{CO}_2 + 6 \text{H}_2\text{O}$
- $\text{H}_2\text{S} + \text{PbCl}_2 \rightarrow \text{PbS} + 2 \text{HCl}$
- $2 \text{C}_3\text{H}_7\text{OH} + 9 \text{O}_2 \rightarrow 6 \text{CO}_2 + 8 \text{H}_2\text{O}$
- $\text{Zn} + \text{CuSO}_4 \rightarrow \text{Cu} + \text{ZnSO}_4$
- $\text{C}_6\text{H}_{12}\text{O}_6 + 6 \text{O}_2 \rightarrow 6 \text{CO}_2 + 6 \text{H}_2\text{O}$
- $\text{C}_2\text{H}_5\text{OH} + 3 \text{O}_2 \rightarrow 2 \text{CO}_2 + 3 \text{H}_2\text{O}$
- $2 \text{Al} + 3 \text{H}_2\text{SO}_4 \rightarrow 3 \text{H}_2 + \text{Al}_2(\text{SO}_4)_3$
- $2 \text{FeCl}_3 + 3 \text{Ca}(\text{OH})_2 \rightarrow 2 \text{Fe}(\text{OH})_3 + 3 \text{CaCl}_2$
- $\text{Pb}(\text{NO}_3)_2 + \text{K}_2\text{CrO}_4 \rightarrow \text{PbCrO}_4 + 2 \text{KNO}_3$
- $\text{Cd}(\text{NO}_3)_2 + (\text{NH}_4)_2\text{S} \rightarrow \text{CdS} + 2 \text{NH}_4\text{NO}_3$
- $\text{Ca}(\text{OH})_2 + 2 \text{NH}_4\text{Cl} \rightarrow 2 \text{NH}_3 + \text{CaCl}_2 + 2 \text{H}_2\text{O}$

### Applying Knowledge

#### Word equations

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- $2 \text{H}_2 + \text{O}_2 \rightarrow 2 \text{H}_2\text{O}$
- $\text{Fe}_2\text{O}_3 + 3 \text{H}_2 \rightarrow 3 \text{H}_2\text{O} + 2 \text{Fe}$
- $2 \text{Na} + 2 \text{H}_2\text{O} \rightarrow 2 \text{NaOH} + \text{H}_2$
- $\text{Ca}_2\text{C} + \text{O}_2 \rightarrow 2 \text{Ca} + \text{CO}_2$
- $2 \text{KI} + \text{Cl}_2 \rightarrow 2 \text{KCl} + \text{I}_2$
- $4 \text{Cr} + 3 \text{SnCl}_4 \rightarrow 4 \text{CrCl}_3 + 3 \text{Sn}$
- $\text{Mg} + \text{CuSO}_4 \rightarrow \text{MgSO}_4 + \text{Cu}$
- $\text{ZnSO}_4 + \text{SrCl}_2 \rightarrow \text{ZnCl}_2 + \text{SrSO}_4$
- $3 \text{NH}_4\text{Cl} + \text{Pb}(\text{NO}_3)_2 \rightarrow 3 \text{NH}_4\text{NO}_3 + \text{PbCl}_2$
- $2 \text{Fe}(\text{NO}_3)_3 + 3 \text{MgS} \rightarrow \text{Fe}_2\text{S}_3 + 3 \text{Mg}(\text{NO}_3)_2$
- $2 \text{AlCl}_3 + 3 \text{Na}_2\text{CO}_3 \rightarrow \text{Al}_2(\text{CO}_3)_3 + 6 \text{NaCl}$
- $2 \text{Na}_3\text{PO}_4 + 3 \text{Ca}(\text{OH})_2 \rightarrow 6 \text{NaOH} + \text{Ca}_3(\text{PO}_4)_2$

### Extension

#### Chemical reactions and chemical equations

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- iron + oxygen  $\rightarrow$  iron(II) oxide  
 $2\text{Fe} + \text{O}_2 \rightarrow 2 \text{FeO}$
- hydrogen chloride + sodium carbonate  $\rightarrow$  carbon dioxide + sodium chloride + water  
 $2 \text{HCl} + \text{Na}_2\text{CO}_3 \rightarrow \text{CO}_2 + 2 \text{NaCl} + \text{H}_2\text{O}$
- aluminum + oxygen  $\rightarrow$  aluminum oxide  
 $4 \text{Al} + 3 \text{O}_2 \rightarrow 2 \text{Al}_2\text{O}_3$
- water + sodium oxide  $\rightarrow$  sodium hydroxide  
 $\text{H}_2\text{O} + \text{Na}_2\text{O} \rightarrow 2 \text{NaOH}$
- hydrogen + nitrogen trifluoride  $\rightarrow$   
nitrogen + hydrogen fluoride  
 $3 \text{H}_2 + 2 \text{NF}_3 \rightarrow \text{N}_2 + 6 \text{HF}$
- chromium(III) sulphate + potassium carbonate  $\rightarrow$   
chromium(III) carbonate + potassium sulphate  
 $\text{Cr}_2(\text{SO}_4)_3 + 3 \text{K}_2\text{CO}_3 \rightarrow \text{Cr}_2(\text{CO}_3)_3 + 3 \text{K}_2\text{SO}_4$
- potassium chlorate  $\rightarrow$  oxygen + potassium chloride  
 $2 \text{KClO}_3 \rightarrow 3 \text{O}_2 + 2 \text{KCl}$
- zinc + copper(II) sulphate  $\rightarrow$  copper + zinc sulphate  
 $\text{Zn} + \text{CuSO}_4 \rightarrow \text{Cu} + \text{ZnSO}_4$