## Section 4.3 Chemical Equations Check Your Understanding

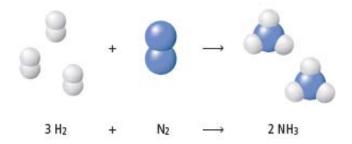


## **Checking Concepts**

1. Most commercial trucks use diesel fuel. Consider the following reaction that occurs during the combustion of diesel fuel.

heptane + oxygen 
$$\rightarrow$$
 carbon dioxide + water  $C_7H_{16} + 11O_2 \rightarrow 7CO_2 + 8H_2O$ 

- (a) List the names of the reactants.
- (b) Give the formulas of the products.
- (c) What is the coefficient of the carbon dioxide?
- (d) What is the meaning of the + symbol on the left side of the equation?
- 2. Study the following diagram, and then write a skeleton equation for the reaction it represents. A white circle represents an H atom. A blue circle represents an N atom.



## **Understanding Key Ideas**

- 3. Balance the following skeleton equations.
  - (a)  $\_AI + \_F_2 \rightarrow \_AIF_3$
  - (b)  $\_PbCI_4 + \__K_3PO_4 \rightarrow \__KCI + \__Pb_3(PO_4)_4$
  - (c)  $\underline{Br_2} + \underline{Fel_3} \rightarrow \underline{I_2} + \underline{FeBr_3}$
  - (d)  $_{Na_2CO_3} + _{Cr(NO_3)_3} \rightarrow _{NaNO_3} + _{Cr_2(CO_3)_3}$
  - (e)  $\underline{M}n + \underline{I}_2 \rightarrow \underline{M}nI_4$
  - (f)  $C_2H_6 + O_2 \rightarrow CO_2 + H_2O$
  - (g)  $K_2SO_4 + AgNO_3 \rightarrow Ag_2SO_4 + KNO_3$
  - (h)  $Ca(OH)_2 + HCI \rightarrow CaCI_2 + H_2O$
  - (i)  $\_Mg_3N_2 \rightarrow \_Mg + \_N_2$
  - (j)  $\_$ Fe +  $\_$ CuCl<sub>2</sub>  $\rightarrow$   $\_$ FeCl<sub>3</sub> +  $\_$ Cu
- 4. Write skeleton equations for the following chemical reactions and then balance them. Be sure to check your formulas carefully before you begin to balance.
  - (a) lithium phosphate + magnesium sulphate → lithium sulphate + magnesium phosphate
  - (b) zinc iodide + copper(I) nitrate → zinc nitrate + copper(I) iodide
  - (c) mercury(II) nitrate + sodium hydrogen carbonate → sodium nitrate + mercury(II) hydrogen carbonate

- (d) nickel(III) iodide and iron(II) sulphide  $\rightarrow nickel(III)$  sulphide + iron(II) iodide
- (e) aluminum hydroxide + hydrogen fluoride → aluminum fluoride + water
- (f) hydrogen chloride + barium hydroxide → barium chloride + water
- (g) calcium bromide + potassium carbonate → calcium carbonate + potassium bromide
- (h) titanium(III) fluoride + cesium sulphite → cesium fluoride + titanium(III) sulphite
- (i) barium sulphate + sodium hydroxide → sodium sulphate + barium hydroxide
- (j) calcium chloride + potassium → potassium chloride + calcium
- (k) hydrogen nitrate + strontium carbonate → strontium nitrate

## Pause and Reflect

The law of conservation of mass was developed after many experiments consistently showed that mass is neither gained nor lost during a chemical reaction. How does our understanding of atoms help explain why mass does not change during chemical reactions?