

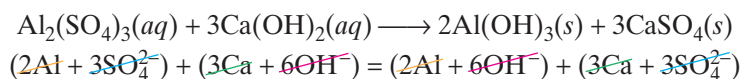
There is one Ca atom on each side of the equation, so the calcium atoms are already balanced. There are two Al atoms on the left and one Al atom on the right. Placing the coefficient 2 in front of  $\text{Al}(\text{OH})_3$  produces the same number of Al atoms on each side of the equation.



Next, checking  $\text{SO}_4^{2-}$  ions shows that there are three  $\text{SO}_4^{2-}$  ions on the left side of the equation and only one on the right side. Placing the coefficient 3 before  $\text{CaSO}_4$  gives an equal number of  $\text{SO}_4^{2-}$  ions on each side.



There are now three Ca atoms on the right, however. By placing the coefficient 3 in front of  $\text{Ca}(\text{OH})_2$ , we once again have an equal number of Ca atoms on each side. This last step also gives six  $\text{OH}^-$  ions on both sides of the equation.



The equation is balanced.

## PRACTICE

Answers in Appendix E

- Write balanced chemical equations for each of the following reactions:
  - Solid sodium combines with chlorine gas to produce solid sodium chloride.
  - When solid copper reacts with aqueous silver nitrate, the products are aqueous copper(II) nitrate and solid silver.
  - In a blast furnace, the reaction between solid iron(III) oxide and carbon monoxide gas produces solid iron and carbon dioxide gas.

### extension

Go to [go.hrw.com](http://go.hrw.com) for more practice problems that ask you to write balanced chemical equations.



Keyword: HC6RXNX

## SECTION REVIEW

- Describe the differences between word equations, formula equations, and chemical equations.
- Write word and formula equations for the reaction in which aqueous solutions of sulfuric acid and sodium hydroxide react to form aqueous sodium sulfate and water.
- Translate the following chemical equations into sentences:
  - $2\text{K}(s) + 2\text{H}_2\text{O}(l) \longrightarrow 2\text{KOH}(aq) + \text{H}_2(g)$
  - $2\text{Fe}(s) + 3\text{Cl}_2(g) \longrightarrow 2\text{FeCl}_3(s)$
- Write the word, formula, and chemical equations for the reaction between hydrogen sulfide gas and oxygen gas that produces sulfur dioxide gas and water vapor.

### Critical Thinking

- INTEGRATING CONCEPTS** The reaction of vanadium(II) oxide with iron(III) oxide results in the formation of vanadium(V) oxide and iron(II) oxide. Write the balanced chemical equation.