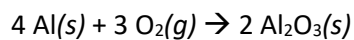11. This equation shows the formation of aluminum oxide, which is found on the surface of aluminum objects exposed to the air:

$$4 \text{ Al}(s) + 3 \text{ O}_2(g) \rightarrow 2 \text{ Al}_2\text{O}_3(s)$$

    a.   Write the six mole ratios that can be derived from this equation.
    b.   How many moles of aluminum are needed to form 3.7 mol Al_2O_3?

12. According to the equation: $4 \text{ Al}(s) + 3 \text{ O}_2(g) \rightarrow 2 \text{ Al}_2\text{O}_3(s)$

    a. How many moles of oxygen are required to react completely with 14.8 mol Al?

    b. How many moles of Al_2O_3 are formed with 0.78 mol O_2 reacts with aluminum?

13. Acetylene gas (C_2H_2) is produced by adding water to calcium carbide (CaC_2).

    $CaC_2(s) + 2 \text{ H}_2O(l) \rightarrow C_2H_2(g) + Ca(OH)_2(aq)$
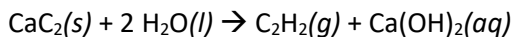
           How many grams of acetylene are produced by adding water to 5.00 g CaC_2?

14. Use the equation in question 13 to determine how many moles of CaC_2 are needed to react completely with 49.0 g H_2O.