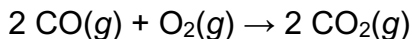
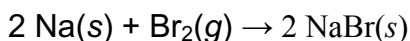


CH1020 Exercises (Worksheet 5)

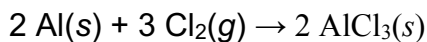
1. A reaction vessel contains 10.0 g CO and 10.0 g O₂ which combine to form CO₂:



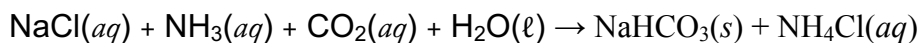
- Which reactant is the limiting reactant?
 - How many grams of CO₂ could be produced?
 - How many grams of the non-limiting reactant are left over?
2. For the reaction below, determine the limiting reactant for each of the initial amounts of reactants.



- 2 mol Na, 2 mol Br₂
 - 1.8 mol Na, 1.4 mol Br₂
 - 2.5 mol Na, 1 mol Br₂
 - 12.6 mol Na, 6.9 mol Br₂
3. For the reaction shown, calculate the theoretical yield (in grams) for each initial amount of reactants



- 2.0 g Al; 2.0 g Cl₂
 - 7.5 g Al; 24.8 g Cl₂
 - 0.235 g Al; 1.15 g Cl₂
4. One reaction in the production of sulfuric acid involves the conversion of sulfur dioxide to sulfur trioxide. In the presence of excess O₂, 88 kg SO₂ produces 106 kg SO₃. What is the percent yield?
5. Baking soda (NaHCO₃) is produced on an industrial scale by the Solvay process. A key reaction in the process is



Suppose a reaction vessel initially contains 58.5 kg NaCl, 18.8 kg NH₃, and excess CO₂ and H₂O. If 66 kg NaHCO₃ is produced, what is the percent yield?

6. After you burn 4.62 mL of ethanol (C₂H₅OH, density, $\rho = 0.789 \text{ g mL}^{-1}$) in the presence of 15.5 g of oxygen gas, you collect 3.72 mL water (density, $\rho = 1.000 \text{ g mL}^{-1}$).
 - a. Write the balanced chemical reaction for the combustion of ethanol in an air ambient.
 - b. What's the limiting reactant in this reaction?
 - c. What's the theoretical yield of water?
 - d. What's the percent yield of water for this reaction?
7. Magnesium oxide can be made by heating magnesium metal in the presence of oxygen. When 10.1 g of Mg reacts with 10.5 g O₂, 11.9 MgO is collected. Determine the percent yield for the reaction.