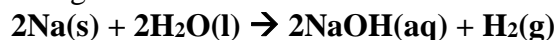


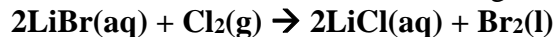
Stoichiometry Calculations

Part One: Mole to Mole Problems

1. How many moles of sodium will react with water to produce 4.0 mol of hydrogen in the following reaction?



2. How many moles of lithium chloride will be formed by the reaction of chlorine with 0.046 mol of lithium bromide in the following reaction?



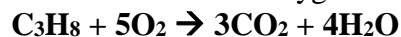
3. Aluminum will react with sulfuric acid in the following reaction.



a. How many moles of H_2SO_4 will react with 18 mol Al?

b. How many moles of *each* product will be produced?

4. Propane burns in excess oxygen according to the following reaction.

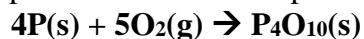


a. How many moles *each* of CO_2 and H_2O are formed from 3.85 mol of propane?

- b. If 0.647 mol of oxygen is used in the burning of propane, how many moles *each* of CO₂ and H₂O are produced? How many moles of C₃H₈ are consumed?

Part Two: Mole to mass problems

1. Phosphorus burns in air to produce a phosphorus oxide in the following reaction:



- a. What mass of phosphorus will be needed to produce 3.25 mol of P₄O₁₀?

- b. If 0.489 mol of phosphorus burns, what mass of oxygen is used? What mass of P₄O₁₀ is produced?

2. Hydrogen peroxide breaks down, releasing oxygen, in the following reaction:

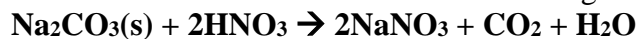


- a. What mass of oxygen is produced when 1.840 mol of H₂O₂ decomposes?

- b. What mass of water is produced when 5.0 mol O₂ is produced by this reaction?

Part Three: Mass to Mole Problems

1. Sodium carbonate reacts with nitric acid according to the following equation.



- a. How many moles of Na₂CO₃ are required to produce 100.0 g of NaNO₃?

- b. If 7.50 g of Na₂CO₃ reacts, how many moles of CO₂ are produced?

2. Hydrogen is generated by passing hot steam over iron, which oxidizes to form Fe₃O₄, in the following equation.

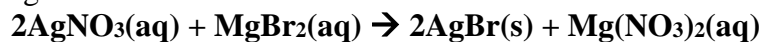


a. If 625 g of Fe₃O₄ is produced in the reaction, how many moles of hydrogen are produced at the same time?

b. How many moles of iron would be needed to generate 27 g of hydrogen?

Part Four: Mass to Mass Problems

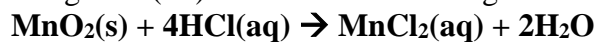
1. Calculate the mass of silver bromide produced from 22.5 g of silver nitrate in the following reaction:



2. What mass of acetylene, C₂H₂, will be produced from the reaction of 90. g of calcium carbide, CaC₂, with water in the following reaction?



3. Chlorine gas can be produced in the laboratory by adding concentrated hydrochloric acid to manganese(IV) oxide in the following reaction:



a. Calculate the mass of MnO₂ needed to produce 25.0g of Cl₂

b. What mass of MnCl₂ is produced when 0.091g of Cl₂ is generated?