

Stoichiometry Worksheet #1

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Consider the following reaction: $2\text{Al(s)} + 3\text{CuCl}_2\text{(aq)} \rightarrow 2\text{AlCl}_3\text{(aq)} + 3\text{Cu(s)}$

1. Write all the possible mole ratios for the above reaction.

2. How many moles of aluminum metal are required to completely react with 4.52 moles of copper (II) chloride?

3. If 15.3 moles of copper metal were formed in this reaction, how many moles of aluminum would you have started with?

4. How many moles of aluminum chloride could you produce from 3.66 moles of aluminum metal?

5. If you had a piece of aluminum foil that had a mass of 27 grams, how many moles of copper would you produce?

For questions 6 - 12, refer to the following reaction:

Ethane (C_2H_6) combusts completely in the presence of oxygen to form carbon dioxide and water.

6. Write a balanced chemical equation for this reaction.

7. Write all the mole ratios for the reaction.

8. How many moles of water would form if only 0.5 moles of ethane combusted?

9. What mass of carbon dioxide would be formed if 3 moles of ethane combusted?

10. How many liters of oxygen at STP are required to produce 100.0 grams of water?

11. If 55.0 grams of ethane were to be completely combusted, what mass of water would be produced?

12. Which would produce more carbon dioxide, 90.0 grams of ethane, or three moles of ethane?

1. How many moles of Cu^{2+} are needed to react with 5.8 moles of AgNO_3 ?
2. How many liters of carbon dioxide are produced from the complete combustion of 5.420 moles of ethanol ($\text{C}_2\text{H}_6\text{O}$)?
3. How many grams of water are produced when 2.500 moles of oxygen gas react with hydrogen gas?
4. How many grams of oxygen are required to produce 358.5 grams of ZnO ? $2\text{Zn} + \text{O}_2 \rightarrow 2\text{ZnO}$
5. Hydrogen gas can be produced by reacting aluminum metal with sulfuric acid. How many grams of sulfuric acid are needed to react with 150.0 grams of aluminum?
6. At STP, how many liters of oxygen gas are required to react completely with 3.6 liters of hydrogen gas to form water?
7. What is the maximum number of grams of PH_3 that can be formed when 6.2 grams of phosphorus reacts with 4.0 grams of hydrogen gas?
 P_4 H_2
8. How many grams of chlorine gas should be produced if 84.2 grams of aluminum chloride and 68.4 grams of bromine are combined?
9. 64.90 grams of potassium chloride are reacted with excess oxygen to produce potassium chlorate. If 77.1 grams are produced, what is the percent yield of this reaction?
10. The reaction of 100.0 grams of salicylic acid, $\text{C}_7\text{H}_6\text{O}_3$, with excess acetic anhydride produces 50.0 grams of aspirin, $\text{C}_9\text{H}_8\text{O}_4$, according to the following equation.
 $\text{C}_7\text{H}_6\text{O}_3 + \text{C}_4\text{H}_6\text{O}_3 \rightarrow \text{C}_9\text{H}_8\text{O}_4 + \text{C}_2\text{H}_4\text{O}_2$
What is the percent yield for this reaction?