

1. In the chemistry lab, you produce 10.0 grams of hydrogen gas from the following chemical reaction:



a) What is the molar mass of HCl and H₂?

b) How many moles of H₂ are in 10.0 g?

c) How many moles of Zn are needed to produce 10.0 g of H₂?

d) How many grams of Zn are needed to produce the 10.0 g of H₂?

e) How many moles of ZnCl₂ are produced?

f) How many grams of ZnCl₂ are produced?

2. A container with 100.0 mL of water has 25.0 grams of glucose ($C_6H_{12}O_6$) dissolved in it. When yeast is added to the solution, ethyl alcohol (or ethanol, C_2H_5OH) and carbon dioxide gas are produced.

- Write out the unbalanced chemical equation for this reaction.
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- Calculate the molar mass for glucose, ethanol and carbon dioxide.
- How many moles of glucose are in the water before the yeast is added?
- How many moles of ethanol are produced when this reaction runs to completion?
- How many grams of ethanol are produced in the completed reaction?
- How many grams of carbon dioxide are produced in the completed reaction?

3. In a CH100 lab (not yours), copper(II) hydroxide precipitate is produced from 10.0 grams of copper(II) sulfate:



- Calculate the molar mass of each reactant and product in this reaction.
- How many moles of copper(II) sulfate are consumed during this chemical reaction?
- How many "molecules" of copper(II) sulfate (numerical quantity not moles) are consumed in this reaction?
- Using the coefficients of this reaction, determine how many moles of sodium hydroxide are reacted in this chemical process?
- How many moles of copper(II) hydroxide and sodium sulfate are produced by this reaction?
- How many molecules (numerical quantity not moles) of copper(II) hydroxide and sodium sulfate are produced by this reaction?
- How many grams of copper(II) hydroxide and sodium sulfate are produced by this reaction?
- What is the % mass of each element in copper(II) hydroxide?