

***Must show all work. Answers must contain #, units, and chemical formula.***

**Molar Mass & Percent Composition**

- a) Calculate the molar mass of ammonium nitrate,  $\text{NH}_4\text{NO}_3$ .
  
- b) Calculate the percent composition for each element in ammonium nitrate,  $\text{NH}_4\text{NO}_3$ .

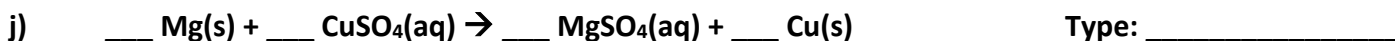
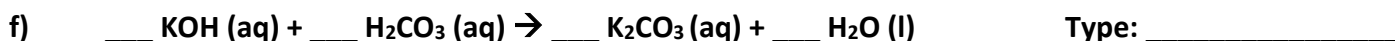
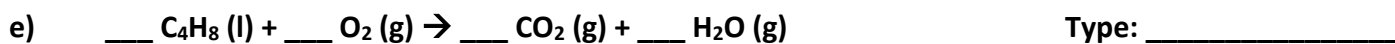
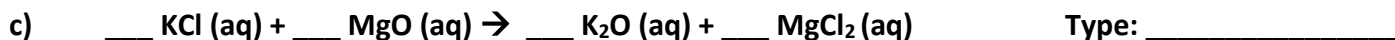
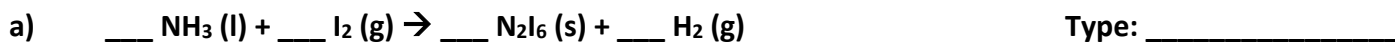
**Empirical Formulas**

- a) Find the empirical formula for a common over-the-counter antacid, which contains 34.59% Al, 61.53 % O, and 3.88 H%.
  
  
  
  
  
  
  
  
  
  
- b) Find the empirical formula for a chemical with a strong, sweet woody odor, which contains 78.90% C, 10.59% H, and 10.51% O.

**Molecular Formulas**

- a) An ingredient, used by the food industry to produce fruity flavors, has an empirical formula of  $\text{C}_2\text{H}_4\text{O}$  and a molar mass of 132 g/mol Calculate the molecular formula of this compound.
  
  
  
  
  
  
  
  
  
  
- b) A common ligand in coordination chemistry has the empirical formula  $\text{C}_3\text{H}_{10}\text{N}_2$  and a molecular mass of 74 g/mol. Find its molecular formula.

## Balancing and Types of Reactions



## Predict the Products & Write a Balanced Equation:

a) Methane gas burns in the presence of oxygen gas to form carbon dioxide gas and water vapor.

b) Solid calcium carbonate decomposes to form solid calcium oxide and carbon dioxide gas.