

### 3 • Molecules and Compounds

#### M O L A R M A S S & % C O M P O S I T I O N

#### I. Molar Masses

Given a periodic table, you should be able to calculate the molecular mass (in u's) or the molar mass (in grams) for any element or compound.

**Examples:** (give answers to two decimal places)

$\text{H}_2\text{SO}_4$	$\text{Cl}_2$	$\text{Ca}(\text{OH})_2$	$\text{HC}_2\text{H}_3\text{O}_2$
$\text{CO}_2$	$\text{N}_2\text{O}$	$\text{NaOCl}$	$\text{Al}_2\text{S}_3$

#### II. Fraction and Percent Composition

It is useful to determine how much of a compound's mass is made up of each element. Water,  $\text{H}_2\text{O}$ , for example has a molar mass of 18.02 g. The H's mass is  $2(1.0079) = 2.02$  g. The O's mass is 16.00 g.

We can set up **fractions** for each element:  $\text{H} = \frac{2.02}{18.02} = 0.112 = 11.2\%$ .  $\text{O} = \frac{16.00}{18.02} = 0.888 = 88.8\%$ .

This is called the **percent composition**. The fraction composition is a good in-between step.

Determine the fraction and percent composition of each element below (answer to one decimal place):

1. $\text{H}_2\text{SO}_4$			
2. $\text{Ca}(\text{OH})_2$			
3. $\text{HC}_2\text{H}_3\text{O}_2$			
4. $\text{CO}_2$			
5. $\text{N}_2\text{O}$			
6. $\text{NaOCl}$			
7. $\text{Al}_2\text{S}_3$			