

## Working with Molar Masses

To get credit for this assignment, you MUST show all work, including the conversion factors you are using. Show how units cancel.

### Determine the mass (in grams) of:

1. 4.5 moles of silver [490 grams Ag]
2. 9.23 moles of dihydrogen dioxide [314 g H<sub>2</sub>O<sub>2</sub>]
3. 15.6 moles of ammonium chloride [834 g NH<sub>4</sub>Cl]
4. 3.4 L of carbon monoxide at STP (standard temperature and pressure) (see Section 6.6 – what volume does one mole of gas require at STP?) [4.3 g CO]

### Determine the number of moles of:

5. 89.23 grams of gold [ .4530 mol Au]
6. 122.1 grams of glucose (C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>) [.6778 mol C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>]
7. 45.0 grams of carbon tetrachloride [.293 mol CCl<sub>4</sub>]
8. 32.7 grams of barium hydroxide [.191 mol Ba(OH)<sub>2</sub>]

### Determine the number of *atoms* (vs. molecules or formula units) in:

9. 14.2 moles of francium oxide [2.56 x 10<sup>25</sup> atoms]
10. 98.3 L of sulfur trioxide (at STP) [1.06 x 10<sup>25</sup> atoms]
11. 35.1 grams of iron(III) oxide [6.62 x 10<sup>23</sup> atoms]
12. 76 kg of sodium carbonate [2.6 x 10<sup>27</sup> atoms]

### The challenge (if you can do this, you pretty much are set for the next two units):

13. Assume iron(III) chloride reacts with copper (II) sulfate in a double replacement reaction.
  - a. How many grams of iron (III) chloride are required to react completely with 8.63 grams of copper (II) sulfate? [5.85 g FeCl<sub>3</sub>]
  - b. How many grams of each product is produced in this reaction? [7.27 g CuCl<sub>2</sub> and 7.21 g Fe<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>]