

## Molar Mass 2

**Directions:** Answer the following questions on a separate piece of paper and *attach it to this worksheet*.

### Part I – Molar Mass

1. The \_\_\_\_\_ of a substance is the mass (in grams) of 1 mol of the substance.
2. The molar mass of a substance can be obtained by \_\_\_\_\_ the atomic masses of the component atoms.
3. Calculate the molar mass for each of the following substances:
  - a. methane,  $\text{CH}_4$
  - b. calcium nitrate,  $\text{Ca}(\text{NO}_3)_2$
  - c. ammonium sulfate,  $(\text{NH}_4)_2\text{SO}_4$
  - d. ethyl alcohol,  $\text{C}_2\text{H}_5\text{OH}$
  - e. iron(III) sulfate,  $\text{Fe}_2(\text{SO}_4)_3$
  - f. chlorine dioxide,  $\text{ClO}_2$
  - g. iron(II) sulfate,  $\text{FeSO}_4$
  - h. strontium nitrate,  $\text{Sr}(\text{NO}_3)_2$
  - i. barium hydride,  $\text{BaH}_2$

### Part II – Molar Mass Calculations

4. Calculate the number of *moles* of the indicated substance in each of the following samples.
  - a. 4.25g of phenol,  $\text{C}_6\text{H}_6\text{O}$
  - b. 4.25g of acetylene,  $\text{C}_2\text{H}_2$
  - c. 4.01g of lithium hydroxide,  $\text{LiOH}$
  - d. 10.0g of sodium chloride,  $\text{NaCl}$
  - e. 2g of ammonium chloride,  $\text{NH}_4\text{Cl}$
5. Calculate the mass in *grams* for each of the following samples.
  - a.  $1.91 \times 10^{-3}$  mol of benzene,  $\text{C}_6\text{H}_6$
  - b.  $1.91 \times 10^{-3}$  mol of acetylene,  $\text{C}_2\text{H}_2$
  - c. 2.27 mol of calcium nitrate,  $\text{Ca}(\text{NO}_3)_2$
  - d. 1.50 mol aluminum iodide,  $\text{AlI}_3$
  - e. 4.00 mol of glucose,  $\text{C}_6\text{H}_{12}\text{O}_6$
6. Calculate the number of *molecules* present for each of the following samples.
  - a. 4.29 mol of nitrogen dioxide,  $\text{NO}_2$
  - b. 4.29g of nitrogen dioxide,  $\text{NO}_2$
  - c.  $1.95 \times 10^{-10}$  mol of hydrogen fluoride,  $\text{HF}$
  - d.  $1.95 \times 10^{-10}$  g of hydrogen fluoride,  $\text{HF}$
  - e. 4.61 g of ammonia,  $\text{NH}_3$
7. Calculate the *volume* for each of the following samples in their gas phase at STP (standard temperature and pressure).
  - a. 2.00 mol of neon
  - b. 2.00 g of neon
  - c. 5.00 mol of nitrogen dioxide
  - d. 5.00 mol of nitrogen monoxide
  - e. 5.00 g of nitrogen monoxide