CLASSIFICATION OF MATTER

1. Classify each of the following as an element, a compound, a homogeneous mixture, or a heterogeneous mixture:
   a. Hydrogen  
   b. Water from a well  
   c. Gold  
   d. Water  
   e. Argon gas  
   f. Sugar (sucrose)  
   g. A bottle of red wine  
   h. Chicken noodle soup  
   i. Blood flowing in a capillary  
   j. Ozone  
   k. Air in a closed bottle  
   l. Air over New York City

2. Which of the following diagrams represent diatomic molecules, polyatomic molecules, molecules that are not compounds, molecules that are compounds, or an elemental form of the substance?

3. Identify the following as elements or compounds.
   a. \( \text{NH}_3 \)  
   b. \( \text{N}_2 \)  
   c. \( \text{S}_8 \)  
   d. \( \text{NO} \)  
   e. \( \text{CO} \)  
   f. \( \text{CO}_2 \)  
   g. \( \text{H}_2 \)  
   h. \( \text{SO}_2 \)

4. Write the formulas for the following ionic compounds:
   a. Sodium oxide  
   b. Iron(II) sulfide  
   c. Cobalt(III) sulfate  
   d. Barium fluoride  
   e. Copper(I) bromide  
   f. Manganese(III) oxide  
   g. Mercury(I) iodide  
   h. Magnesium phosphate

5. Which of the following compounds are likely to be ionic? Which of the following are likely to be molecular?
   a. \( \text{SiCl}_4 \)  
   b. \( \text{LiF} \)  
   c. \( \text{BaCl}_2 \)  
   d. \( \text{B}_2\text{H}_6 \)  
   e. \( \text{KCl} \)  
   f. \( \text{C}_2\text{H}_4 \)  
   g. \( \text{CH}_4 \)  
   h. \( \text{NaBr} \)  
   i. \( \text{BaF}_2 \)  
   j. \( \text{CCl}_4 \)  
   k. \( \text{ICl} \)  
   l. \( \text{CsCl} \)  
   m. \( \text{NF}_3 \)  

6. Explain clearly what is meant by the statement “The atomic mass of gold is 196.97 amu.”

7. The atomic masses of \( ^{35}\text{Cl} \) (75.53%) and \( ^{37}\text{Cl} \) (24.47%) are 34.968 amu and 36.956 amu, respectively. Calculate the average atomic mass of chlorine. The percentages in parentheses denote the relative abundances.

8. The atomic masses of \( ^{6}\text{Li} \) and \( ^{7}\text{Li} \) are 6.0151 amu and 7.0160 amu, respectively. Calculate the natural abundances of these two isotopes. The average atomic mass of Li is 6.941 amu.

*Similar problems: 8 & 9*