

## Chem11 Molar Mass : Worksheet-40

1) Give the symbols for the following elements.

- |               |             |              |
|---------------|-------------|--------------|
| a) magnesium  | b) aluminum | c) manganese |
| d) boron      | e) calcium  | f) silicon   |
| g) sodium     | h) sulfur   | i) potassium |
| j) silver     | k) zinc     | l) chlorine  |
| m) bromine    | n) chromium | o) iron      |
| p) cobalt     | q) lead     | r) copper    |
| s) molybdenum | t) lithium  |              |

2) Calculate the molar mass (grams per mole to one decimal place) of the following :

- |  |  |
|--|--|
| a) chlorine ( $\text{Cl}_2$ )                  | b) methane ( $\text{CH}_4$ )                 |
| c) phosphoric acid ( $\text{H}_3\text{PO}_4$ ) | d) calcium sulfate ( $\text{CaSO}_4$ )       |
| e) silver nitrate                              | f) silver chloride                           |
| g) nitric acid ( $\text{HNO}_3$ )              | h) sulfuric acid ( $\text{H}_2\text{SO}_4$ ) |
| i) aluminum sulfate                            | j) hydrogen cyanide                          |

3) Calculate the number of moles in each of the following :

- |                                  |                                    |
|----------------------------------|------------------------------------|
| a) 90. g of $\text{H}_2\text{O}$ | b) 49 g of $\text{H}_2\text{SO}_4$ |
| c) 1.08 g of Ag                  | d) 28.7 g of AgCl                  |
| e) 16 g of O atoms               | f) 212.5 g of $\text{KNO}_3$       |
| g) 4.5 g of $\text{HNO}_3$       | h) 178.5 g of $\text{NH}_3$        |
| i) 50. g of Fe                   | j) 4.03 g of Mg                    |

- 4) Calculate the number of moles in each of the following :
- a) 71 g of chlorine molecules    b) 40.0 g of water
  - c) 4.0 g of oxygen molecules    d) 132 g of  $C_2F_2H_4$
  - e) 2.87 g of AgCl                      f) 4.24 g of  $AgNO_3$
  - g) How many fluorine atoms are there in 132 g of  $C_2F_2H_4$ ?
- 5) If one oxygen molecule has a mass of  $5.32 \times 10^{-23}g$ , then how many molecules are in 32g of oxygen gas?
- 6) If one hydrogen molecule has a mass of  $3.35 \times 10^{-24}g$ , then how many molecules are in 2.016g of hydrogen?
- 7) If one carbon dioxide molecule has a mass of  $7.31 \times 10^{-23}g$ , then how many molecules make up 44.0g of  $CO_2$ ?
- 8) If  $6.02 \times 10^{23}$  molecules make up 28.0g of nitrogen gas, then what is the mass (in grams) of one molecule of nitrogen?
- 9) If  $6.02 \times 10^{23}$  atoms make up 39.95g of argon, then what is the mass (in grams) of one atom of argon?
- 10) If  $6.02 \times 10^{23}$  molecules make up 64.1g of sulfur dioxide, then what is the mass (in grams) of one molecule of sulfur dioxide?
- 11) Calculate the mass in grams of an oxygen atom. If one oxygen atom has a mass of 16.0 A.M.U.s, (Atomic Mass Units), then one A.M.U. = \_\_\_\_\_ g. (give three sig figs)
- 12) Calculate the mass of one atom of gold. (in grams)

Answers : 1) see periodic table, 2)a) 70.9, b) 16.0, c) 98.0, d) 136.1, e) 169.9, f) 143.3, g) 63.0, h) 98.1, i) 342.1, j) 27.0., 3)a) 5.0, b) 0.50, c) 0.010, d) 0.200, e) 1.0, f) 2.102, g) 0.071, h) 10.48, i) 0.90, j) 0.166, 4)a) 1.0, b) 2.22, c) 0.13, d) 2.00, e) 0.0200, f) 0.0250, g) 4.00 mol., 5)  $6.02 \times 10^{23}$ , 6)  $6.02 \times 10^{23}$ , 7)  $6.02 \times 10^{23}$ , 8)  $4.65 \times 10^{-23}$ , 9)  $6.64 \times 10^{-23}$ , 10)  $1.06 \times 10^{-22}$ , 11)  $1.66 \times 10^{-24}$ , 12)  $3.27 \times 10^{-22}$ .