

## MOLE AND PERCENT WORKSHEET

1. How many pennies are in a mole of pennies? How many thousand-dollar bills (k-notes!) is that mole of pennies equal to?

2.  $\text{NO}_2$  is the molecular formula for nitrous dioxide (also known as nitrogen dioxide). List the information available to you from this formula?.

3.  $\text{C}_2\text{H}_2$  is the molecular formula for ethylene (A.K.A. acetylene).

(a) How many atoms are in one molecule?

(b) Which atoms make up acetylene?

(c) How many moles of atoms are in one molecule of acetylene?

(d) How many molecules are in 5.3 moles of acetylene?

(e) How many atoms are in a mole of acetylene?

4. Calculate the molar mass of a mole of the following materials:

(a) Al

(b) Ra

(c) Co

(d) CO

(e)  $\text{CO}_2$

(f) HCl

(g)  $\text{Na}_2\text{CO}_3$

(h)  $\text{Ca}(\text{NO}_3)_2$

(i)  $(\text{NH}_4)_3(\text{PO}_4)$

(j)  $\text{H}_2\text{O}$

(l) Epsom salts -  $\text{Mg}(\text{SO}_4) \cdot 7\text{H}_2\text{O}$

(m) blue vitriol -  $\text{Cu}(\text{SO}_4) \cdot 5\text{H}_2\text{O}$  ?

5. Calculate the number of moles in:

(a) 2.3 lb of carbon

(b) 0.014 g of Tin

(c) a 5 Oz silver bracelet

(d) a pound of table salt

(e) a 350 kg cast iron engine block

(f) a gal. of water (8.3 lb)

(g) a ton of sand ( $\text{SiO}_2$ )

(h) 6.2 grams of blue vitriol

(i) a pound of Epsom salts ?

6. Calculate the number of atoms in:

(a) 100 g of Argon

(b) 1.21 kg aluminum foil

(c) a 28 lb lead brick

(d) the no. ( $1 \times 10^?$ ) kg of water in an olympic swimming pool

(e) 7 kg of hydrogen gas

(f) a tonne of calcium nitrate ?

7. What is the percentage composition of oxygen in each of the following materials:

(a) CO

(b) CO<sub>2</sub>

(c) (NO<sub>3</sub>)<sup>-</sup>

(d) isopropyl alcohol C<sub>3</sub>H<sub>8</sub>O

(e) calcium nitrate

(f) blue vitriol - Cu(SO<sub>4</sub>)·5H<sub>2</sub>O ?

8. What is the percentage composition of phosphate in each of the following materials:

(a) phosphoric acid

(b) sodium carbonate

(c) ammonium phosphate

(d) calcium phosphate ?

9. What is the percentage composition of sulfate in each of the following materials:

(a) sulfuric acid

(b) sodium sulfate

(c) Epsom salts

(d) aluminum sulfate ?

## ANSWERS TO MOL AND PERCENT PROBLEMS

1a. 6.023 E23 pennies      1b. 6.023 E18 k-Notes      2a. Covalent

2b. Elements in it (N and O)      2c. Number of atoms of each element

3a. 4    3b. C & H    3c. 6.64 E-24      3d. 3.1922 E24      3e. 2.4092 E24

4a. 27.0      4b. 226.0      4c. 58.9      4d. 28.0      4e. 44.0

4f. 36.5      4g. 106.0      4h. 164.1      4i. 149.0      4j. 18.    4k. 246.4    4l. 249.6

5a. 86.9      5b. 1.18 E-4    5c. 1.31    5d. 7.75    5e. 6.27 E3    5f. 210      5g. 1.51 E4    5h. 0.0248  
5i. 1.84

6a. 1.51 E24      6b. 2.69 E25      6c. 3.69 E25      6d. 1.00 E33      6e. 4.22E27

6f. 3.30 E28

7a. 57.1%    7b. 72.7%    7c. 77.4%    7d. 26.7%      7e. 58.5%    7f. 57.7%

8a. 96.9%    8b. 0%    8c. 63.8%    8d. 61.2%

9a. 98.0%    9b. 67.6%    9c. 39.0%    9d. 84.2%