$= 3.7514 \qquad \frac{1}{26.9815} = 0.13904$

$= 0.13904 \qquad \frac{6.02214 \ 10^{23}}{} = 8.3729 \ 10^{22}$

7.2 Molecular Mass

Examples:

> ***Molecular Mass = sum of the masses of the individual atoms***

$$1\ atom\ C\left(\frac{12\,011\ amu\ C}{atom\ C}\right)+4\ atoms\ H\left(\frac{1\,008\ amu\ H}{atom\ C}\right)=16.043\ amu\ CH_4$$

$$2\ atom\ Al\left(\frac{26\,98\ amu\ Al}{atom\ Al}\right)+3\ atoms\ O\left(\frac{16\,00\ amu\ O}{atom\ O}\right)=101.96\ amu\ Al_2O_3$$

$$1\ atom\ Fe\left(\frac{55\,85\ amu\ Al}{atom\ Al}\right)+1\ atom\ S\left(\frac{32\,07\ amu\ S}{atom\ S}\right)+4\ atom\ O\left(\frac{16\,00\ amu\ O}{atom\ O}\right)=151.92\ amu\ FeSO_4$$

$$n_{FeSO_4} = 28.115\ g\ FeSO_4 \ \frac{mol\ FeSO_4}{151.91\ g\ FeSO_4} = 0.18508\ mol\ FeSO_4$$

$$N_{Fe} = 0.18508\ mol\ FeSO_4 \ \frac{1\ mol\ Fe}{1\ mol\ FeSO_4} \ \frac{6.0221\ 10^{23}\ molecule}{mol} = 1.1146\ 10^{23}\ molecule\ Fe$$

$$N_S = 0.18508\ mol\ FeSO_4 \ \frac{1\ mol\ S}{1\ mol\ FeSO_4} \ \frac{6.0221\ 10^{23}\ molecule}{mol} = 1.1146\ 10^{23}\ molecule\ S$$

$$N_{O_2} = 0.18508\ mol\ FeSO_4 \ \frac{4\ mol\ O}{1\ mol\ FeSO_4} \ \frac{1\ mol\ O_2}{2\ mol\ O} \ \frac{6.0221\ 10^{23}\ molecule}{mol} = 2.2291\ 10^{23}\ molecule\ O_2$$

Example

$$n_{FeSO_4} = 28.115\ g\ FeSO_4 \ \frac{mol\ FeSO_4}{151.91\ g\ FeSO_4} = 0.18508\ mol\ FeSO_4$$

$$m_{Fe} = 0.18508\ mol\ FeSO_4 \ \frac{1\ mol\ Fe}{1\ mol\ FeSO_4} \ \frac{55.85\ g\ Fe}{mol\ Fe} = 10.336\ g\ Fe$$

$$m_S = 0.18508\ mol\ FeSO_4 \ \frac{1\ mol\ S}{1\ mol\ FeSO_4} \ \frac{32.066\ g}{} \quad 5.9348$$

$$_4 \ \frac{4}{} \ \frac{}{_4}$$

Example: *Na*

Example:

$$m_C = 47.29\ mg\ compound\ \frac{37.0\ g\ C}{100.00\ g\ compound} = 17.5\ mg\ C$$

$$m_H = 47.29\ mg\ compound\ \frac{2.21\ g\ H}{100.00\ g\ compound} = 1.05\ mg\ H$$

$$m_O = 47.29\ mg\ compound\ \frac{42.4\ g\ O}{100.00\ g\ compound} = 20.1\ mg\ O$$

$$m_N = 47.29\ mg\ compound\ \frac{18.4\ g\ N}{100.00\ g\ compound} = 8.70\ mg\ N$$

$$17.5\ mg\ C + 1.04\ mg\ H + 20.0\ mg\ O + 8.70\ mg\ N = 47.3\ mg\ compound$$