

PERCENT COMPOSITION II

1. Hydrogen fuels are rated with respect to their hydrogen content. Determine the percent hydrogen for the following fuels.

A.) Ethane, C_2H_6 $\frac{6.06}{30.08} \times 100 = 20.15\% H$

B.) Methane, CH_4 $\frac{4.04}{16.05} \times 100 = 25.17\% H$

C.) Whale Oil, $C_{32}H_{64}O_2$ $\frac{64.64}{480.96} \times 100 = 13.44\% H$

2. Find the percent of nitrogen in ammonium nitrate, (NH_4NO_3) , an important source of nitrogen in fertilizers.

$\frac{28.02}{80.08} \times 100 = 34.99\% N$

3. Calculate the mass percent of each element in the following compounds:

A.) Iron (III) oxide Fe_2O_3

%Fe $\frac{111.7}{159.7} \times 100 = 69.94\% Fe$

%O $\frac{48}{159.7} \times 100 = 30.06\% O$

B.) Silver oxide Ag_2O

%Ag $\frac{215.74}{231.74} \times 100 = 93.1\% Ag$

%O $\frac{16}{231.74} \times 100 = 6.9\% O$

C.) Mercury (II) oxide HgO

%Hg $\frac{200.59}{216.59} \times 100 = 92.61\% Hg$

%O $\frac{16}{216.59} \times 100 = 7.39\% O$

D.) sodium sulfide Na_2S

$$\% \text{Na} = \frac{45.98}{78.04} \times 100 = 58.92\% \text{Na}$$

$$\% \text{S} = \frac{32.06}{78.04} \times 100 = 41.08\% \text{S}$$

4. Determine the mass percent of sodium in sodium sulfate. Na_2SO_4

$$\frac{45.98}{142.04} \times 100 = 32.37\% \text{Na}$$

5. Urea, $\text{CO}(\text{NH}_2)_2$ and ammonia, NH_3 are two compounds used as a source of nitrogen in fertilizers. Calculate the mass percent of nitrogen in each.

Urea: $\frac{28.01}{60.07} \times 100 = 46.63\% \text{N}$

Ammonia: $\frac{14.01}{17.04} \times 100 = 82.22\% \text{N}$

6. Calculate the percent of each of the following in the compound sodium sulfate decahydrate. $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$

$$\% \text{Na} = \frac{45.98}{322.24} \times 100 = 14.27\% \text{Na}$$

$$\% \text{S} = \frac{32.06}{322.24} \times 100 = 9.95\% \text{S}$$

$$\% \text{O} = \frac{64}{322.24} \times 100 = 19.86\% \text{O}$$

$$\% \text{H}_2\text{O} = \frac{180.2}{322.24} \times 100 = 55.92\% \text{H}_2\text{O}$$