How many molecules of water are in a glass that contains 45.00 g of H_2O?

$$\frac{45.00\text{ g } H_2O}{x} = \frac{18.02\text{ g } H_2O}{6.022\times10^{23}\text{ molecules}}$$ ← from PT

$$x = 1.504\times10^{24}\text{ molecules}$$

– OR –

$$\frac{45.00\text{ g } H_2O}{18.02\text{ g } H_2O} \left| \frac{6.022\times10^{23}\text{ molecules}}{} \right. = 1.504\times10^{24}\text{ molecules}$$

How many atoms of hydrogen are in 95.00 g of ammonia?

$$\frac{95.00\text{ g } NH_3}{x} = \frac{17.04\text{ g } NH_3}{6.022\times10^{23}\text{ molecules}}$$

$$x = 3.357\times10^{24}\text{ molecules}$$

$$\frac{3\text{ H atoms}}{1\ NH_3\text{ molecule}} = \frac{x}{3.357\times10^{24}\text{ molecules}}$$

$x = 10.1\times10^{24}$

$= 1.01\times10^{25}$ atoms H

Determining a Formula from % composition:

(1) Use the given mass -or- assume 100g

(2) Use given % to find the mass of each element.

(3) Convert mass of each element to moles

(4) Find the integer ratio of each element to one another

A compound is 24.75% K, 34.75% Mn, and 40.51% O. Find the compound's formula:

(1) Assume 100g: (2) Mass of each elem: (3) Conv to moles:

$24.75\%\ K = 24.75\text{g}\ K \times \frac{1\text{mol}\ K}{39.10\text{g}} = .6330\ \text{mol}\ K$

$34.75\%\ Mn = 34.75\text{g}\ Mn \times \frac{1\text{mol}\ Mn}{54.94\text{g}} = .6325\ \text{mol}\ Mn$

$40.51\%\ O = 40.51\text{g}\ O \times \frac{1\text{mol}\ O}{16.00\text{g}} = 2.532\ \text{mol}\ O$

(4) Find ratio of each element to one another by ÷ each molar amt by the smallest mole amt:

$.6330\ \text{mol}\ K \div .6325 = 1$

$.6325\ \text{mol}\ Mn \div .6325 = 1$

$2.532\ \text{mol}\ O \div .6325 = 4$

$KMnO_4$