Homework

20. a) $3.20 \times 10^{-3}\ \text{mol } CO_2 \times \frac{22.4\ \text{L } CO_2}{1\ \text{mol } CO_2}$

$= \boxed{0.0717\ \text{L } CO_2}$

(16) $5.66\ \text{mol } CaCO_3 \times \frac{100.09\ \text{g } CaCO_3}{1\ \text{mol } CaCO_3} = \boxed{567\ \text{g } CaCO_3}$

$CaCO_3 \rightarrow (1 \times 40.08) + (1 \times 12.01) + (3 \times 16.00)$

$100.09\ \text{g/mol}$

Empirical Formulas

The empirical formula of a compound is the smallest whole-number ratio of the atoms in a compound.

Determining the Empirical Formula of a Compound

Ex. A compound is analyzed and found to contain 25.9% nitrogen and 74.1% oxygen. What is the empirical formula of the compound?

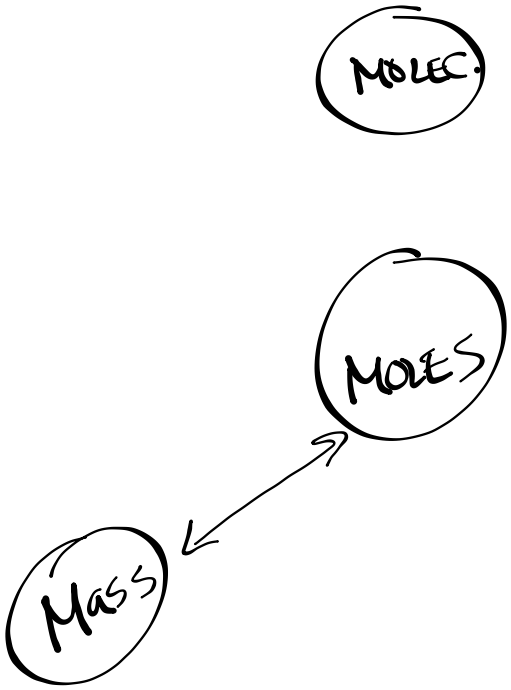
$$25.9\,g\,N \times \frac{1\ mol\ N}{14.01\,g\,N} = \frac{1.8487\ mol\ N}{1.8487\ mol} = 1$$

$$74.1\,g\,O \times \frac{1\ mol\ O}{16.00\,g\,O} = \frac{4.63125\ mol\ O}{1.8487\ mol} = 2.5$$

$N_{1.8487}O_{4.63125}$

$NO_{2.5}$

N_2O_5


MOLEC.
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Determining the Empirical Formula of a Compound

Ex. A compound is analyzed and found to contain 75.0% carbon, 8.4% hydrogen and 16.6% oxygen. What is the empirical formula of the compound?

$Na_2CO_3 \rightarrow$ 105.99 g/mol

%Na %C %O

Homework

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p. 306 #32, 33
p. 307 #34, 35
p. 310 #36, 37