

## Review: Molecular Formula and Stoichiometry Quiz

1) A compound contains 92.25% C and 7.75% H. Find the molecular formula of the compound if its molecular mass is 78g.

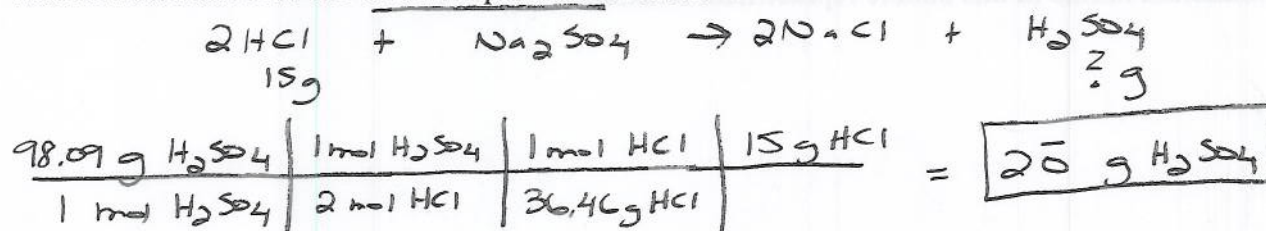
$\frac{1 \text{ mol C}}{12.01 \text{ g C}}$	$\frac{92.25 \text{ g C}}{7.6733}$	$= 7.6811 \text{ mol C} = 1$	Empirical = CH = 13.02g	Molecular C <sub>6</sub> H <sub>6</sub>
$\frac{1 \text{ mol H}}{1.01 \text{ g H}}$	$\frac{7.75 \text{ g H}}{7.6733}$	$= 7.6733 \text{ mol H} = 1$		

$\frac{78 \text{ g}}{13.02 \text{ g}} = 6$

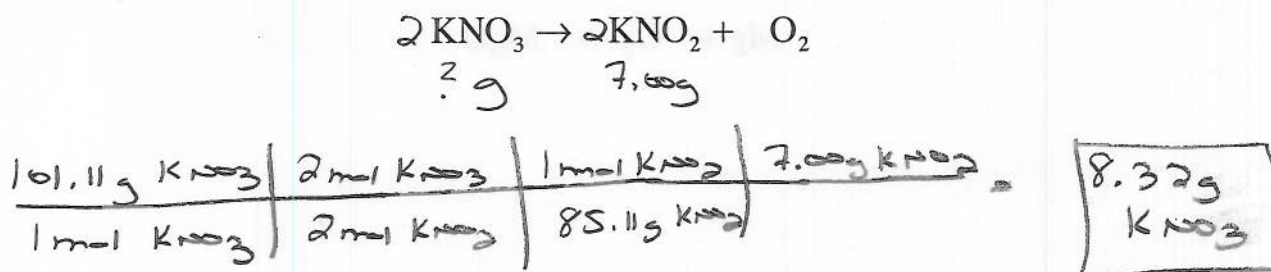
2) Find the formula of the hydrate with the following analysis: 151 g CaCl<sub>2</sub>, 49 g H<sub>2</sub>O.

$\frac{1 \text{ mol CaCl}_2}{110.98 \text{ g CaCl}_2}$	$\frac{151 \text{ g CaCl}_2}{1.3606}$	$= 1.3606 \text{ mol CaCl}_2 = 1$	CaCl <sub>2</sub> · 2H <sub>2</sub> O
$\frac{1 \text{ mol H}_2\text{O}}{18.02 \text{ g H}_2\text{O}}$	$\frac{49 \text{ g H}_2\text{O}}{1.3606}$	$= 2.7192 \text{ mol H}_2\text{O} = 2$	

3) How many grams of sulfuric acid are produced when 15 grams of hydrochloric acid reacts with sodium sulfate in this double replacement reaction?



4) How many grams of potassium nitrate are required to produce 7.00 g of potassium nitrite according to the equation below? What type of reaction is this?



5) What other type of reactions have we studied?



## Review: Molecular Formula and Stoichiometry Quiz (Version 2)

1) A compound contains 92.3% C and 7.7% H. Find the molecular formula of the compound if its molecular mass is 26 g.

$\frac{1 \text{ mol C} \mid 12.01 \text{ g C}}{12.01 \text{ g C}} = \frac{92.3 \text{ g C}}{12.01 \text{ g C}} = 7.6853 \text{ mol C} = 1$	$\frac{1 \text{ mol H} \mid 1.01 \text{ g H}}{1.01 \text{ g H}} = \frac{7.7 \text{ g H}}{1.01 \text{ g H}} = 7.6238 \text{ mol H} = 1$	Empirical: CH 13.02 g $\frac{26}{13.02} = 2$ <div style="border: 1px solid black; padding: 5px; display: inline-block;">Molecular: C<sub>2</sub>H<sub>2</sub></div>
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2) Find the formula of the hydrate with the following analysis: 25.36 g BeBr<sub>2</sub>, 16.24 g H<sub>2</sub>O.

$\frac{1 \text{ mol BeBr}_2 \mid 168.81 \text{ g BeBr}_2}{168.81 \text{ g BeBr}_2} = \frac{25.36 \text{ g BeBr}_2}{168.81 \text{ g BeBr}_2} = 0.1502 \text{ mol BeBr}_2 = 1$	$\frac{1 \text{ mol H}_2\text{O} \mid 18.02 \text{ g H}_2\text{O}}{18.02 \text{ g H}_2\text{O}} = \frac{16.24 \text{ g H}_2\text{O}}{18.02 \text{ g H}_2\text{O}} = 0.9012 \text{ mol H}_2\text{O} = 6$	<div style="border: 1px solid black; padding: 5px; display: inline-block;">BeBr<sub>2</sub> · 6H<sub>2</sub>O</div>
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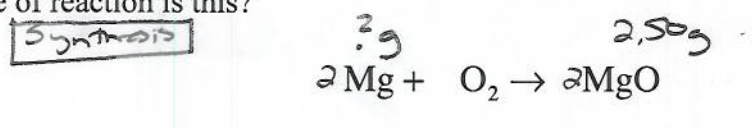
3) How many grams of nitric acid are produced when 23 grams of hydrochloric acid reacts with potassium nitrate in this double replacement reaction?

$$\text{HCl} + \text{KNO}_3 \rightarrow \text{HNO}_3 + \text{KCl}$$

$$23 \text{ g} \qquad \qquad \qquad ? \text{ g}$$

$\frac{63.02 \text{ g HNO}_3 \mid 1 \text{ mol HNO}_3}{1 \text{ mol HNO}_3} = \frac{23 \text{ g HCl}}{36.46} = 46 \text{ g HNO}_3$	$\frac{1 \text{ mol HCl} \mid 36.46 \text{ g HCl}}{36.46 \text{ g HCl}} = \frac{23 \text{ g HCl}}{36.46} = 0.631 \text{ mol HCl}$	$\frac{1 \text{ mol HNO}_3 \mid 63.02 \text{ g HNO}_3}{63.02 \text{ g HNO}_3} = \frac{46 \text{ g HNO}_3}{63.02 \text{ g HNO}_3} = 0.73 \text{ mol HNO}_3$	$\frac{1 \text{ mol HCl} \mid 36.46 \text{ g HCl}}{36.46 \text{ g HCl}} = \frac{23 \text{ g HCl}}{36.46} = 0.631 \text{ mol HCl}$	$= 46 \text{ g HNO}_3$
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4) How many grams of magnesium would be required to produce 2.50 g of magnesium oxide? What type of reaction is this?



$\frac{24.31 \text{ g Mg} \mid 2 \text{ mol Mg}}{1 \text{ mol Mg}} = \frac{2.50 \text{ g MgO}}{40.31 \text{ g MgO}} = 1.51 \text{ g Mg}$	$\frac{2 \text{ mol Mg} \mid 48.62 \text{ g Mg}}{48.62 \text{ g Mg}} = \frac{2.50 \text{ g MgO}}{40.31 \text{ g MgO}} = 0.062 \text{ mol MgO}$	$\frac{1 \text{ mol MgO} \mid 40.31 \text{ g MgO}}{40.31 \text{ g MgO}} = \frac{2.50 \text{ g MgO}}{40.31 \text{ g MgO}} = 0.062 \text{ mol MgO}$	$= 1.51 \text{ g Mg}$
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5) What other type of reactions have we studied?

- Decomposition
- Single Replacement
- Double Replacement