Using Analogies to Learn Stoichiometry

Objectives

- Choose a chemical reaction and it's balanced equation
- Choose a non-chemistry process that is analogous to the chosen chemical reaction and has the same ratio of reactants
- Create a mathematical stoichiometry problem to illustrate the analogy

The "Reactions"

The synthesis of water

$2H_2 + O_2 \rightarrow 2H_2O$

Making smores

2 graham crackers + 1 marshmallow → 1 Smores

Using symbols…

The synthesis of water

$2H_2 + O_2 \rightarrow 2H_2O$

Making smores

2GC + 1M → 1S

The ratios of reactants in both processes is 2:1

The synthesis of water

$2H_2 + O_2 \rightarrow 2H_2O$

Overall ratio is 2:1:2

Making smores

2GC + 1M → 1S

Overall ratio is 2:1:1

Analogous Stoichiometry Problems

How many water molecules can you make if you have 10 hydrogen molecules?

$2H_2 + O_2 \rightarrow 2H_2O$

How many smores can you make if you have 10 graham crackers

2GC + 1M → 1S

Use the ratios to solve

$10H_2 \times \frac{2H_2O}{2H_2} = 10\ H_2O$

You could make **10 water molecules**

$10GC \times \frac{1S}{2GC} = 5\ S$

You could make **5 smores**

Why are the answers different?

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The ratio of hydrogen to water is 2:2
The ratio of graham crackers to smores is 2:1