

LO: Students will be able to determine limiting reagents and percent yield.

DOL: Students will correctly calculate limiting reagents and percent yield at least 4/5 times.

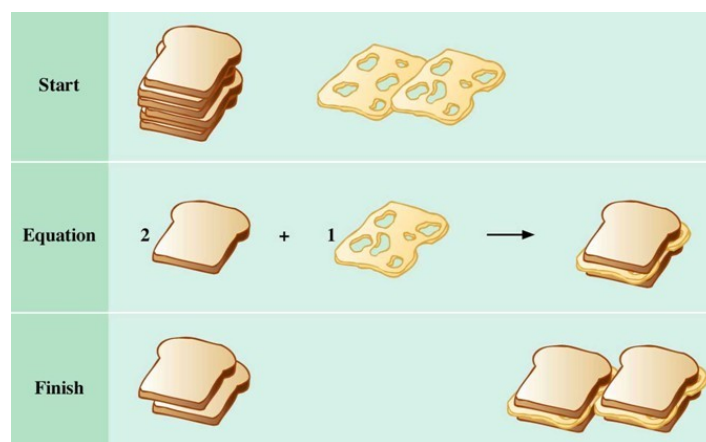
Limiting Reagent (also known as limiting reactant)

-In a chemical reaction, this is the substance or substances that run out first.

-There can be more than one limiting reagent if two substances are completely consumed at the same time

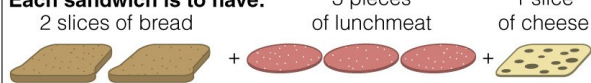
-The amount of products created and the amount of non-limiting reagents remaining all depend on the limiting reagent

Limiting Reagent of a Cheese Sandwich

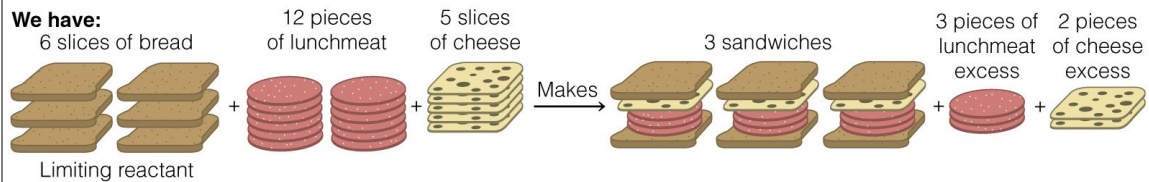


Limiting Reagent of a deli sandwich:

Each sandwich is to have:



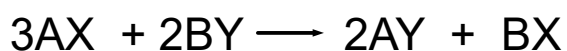
We have:



Using ratios to determine limiting reagents:

- always ensure that your chemical equation is balanced
- consider the stoichiometric ratios of ONLY the reactant
- determine how much a "A" you need to react with "B"
- you will either have "Exactly enough A", "Not enough A", or "Too much A"

Generic Equation Example:



Based on the above balanced equation, which reactant would be your limiting reagent if you have 2.45 mol AX and 1.75 mol BY ?

Based on your limiting reagent, how much of each product will be created?

Based on your limiting reagent, how much of the non-limiting reagent remains?

Percent Yield:

- The "yield" is the quantity of something that is produced.
- Theoretical yield is how much SHOULD have been produced.
- Actual yield is the amount that WAS produced.
- Percent yield is the Actual divided by the Theoretical

Example:

A foreman needed his sheet rock guys to install 45 pieces of sheet rock today. Due to an electrical problem, they were only able to install 32 pieces. What was their percent yield of installed pieces?

The next day, the goal was again 45 pieces. Working through lunch and breaks, the crew installed 52 pieces. What was their percent yield for this day?

What was their percent yield for both days together?

If 2.85 mols of CH_4 is burned with 4.75 mols of O_2 , which gas will run out first?

Hint: write a balanced equation, remember the products of burning a hydrocarbon are always water and carbon dioxide.

How many mols of carbon dioxide should be created?

Only 2.25 mols of carbon dioxide was produced, what is the percent yield?

How many mols of water should be produced?