> 1. **Percent Purity**
> 2. **Percent Yield**

Percent Purity

Chemicals don't always exist in pure form.
- The purity of a chemical is indicated as the % purity
- The impure substance contains another substance to make the mass higher than a pure substance
- ONLY THE PURE SUBSTANCE WILL REACT TO PRODUCE A PURE PRODUCT!
- Affects reactants – what are you putting into the reaction to react

> Percent Purity =

Example 1.
An 85.00 g sample of water is 95% pure. What is the mass of pure water that reacts?

This impure water sample reacts with calcium oxide to produce calcium hydroxide. What mass of calcium hydroxide is produced if the water is reacted with excess calcium oxide?

Example 2.
A sample of water is 35% pure. If the mass of pure water is 65g, what is the mass of the total sample?

Example 3.

If 100.0g of FeO produces 12.0g of pure Fe according to the reaction. (Is the 100.0g sample of FeO pure or impure?)
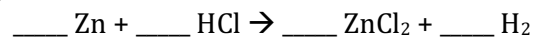
$$\underline{\quad} \ FeO + \underline{\quad} \ C + \underline{\quad} \ O_2 \rightarrow \underline{\quad} \ Fe + \underline{\quad} \ CO_2$$
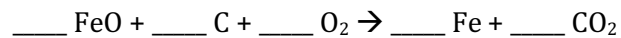
a. How much (mass) FeO was needed to produce Fe?

b. What is the percentage purity of FeO used?

Example 4.

Zinc metal has a purity of 89.5%.

$$\underline{\quad} \ Zn + \underline{\quad} \ HCl \rightarrow \underline{\quad} \ ZnCl_2 + \underline{\quad} \ H_2$$

What mass of this impure zinc is required to produce 975 mL of hydrogen gas at STP?
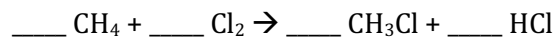
Percent Yield

Sometimes 100% of the expected amount of products cannot be attained from a reaction. This can occur because:
1. The reactants may not all react
2. Some of the products are lost due to the experiment procedures

- Affects products – how much product did you actually produce?
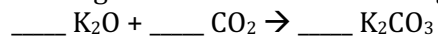
Percent Yield =

Example 1.
Given the following reaction:
$$\_\_\_\_ CH_4 + \_\_\_\_ Cl_2 \rightarrow \_\_\_\_ CH_3Cl + \_\_\_\_ HCl$$
When 15.0g of CH_4 reacts with excess Cl_2, a total of 29.7g of CH_3Cl is formed. What is the percentage yield of the reaction?

Example 2.
What mass of K_2CO_3 is produced when 1.50g of K_2O is reacted according to the reaction,
$$\_\_\_\_ K_2O + \_\_\_\_ CO_2 \rightarrow \_\_\_\_ K_2CO_3$$
if the reaction has a 76.0% yield?

Example 3.
What mass of CuO is required to make 10.0g of Cu according to the reaction
$$\text{\_\_\_\_ NH}_3 + \text{\_\_\_\_ CuO} \rightarrow \text{\_\_\_\_ N}_2 + \text{\_\_\_\_ Cu} + \text{\_\_\_\_ H}_2\text{O}$$
if the reaction has a 58.0% yield?