

## IDENTIFYING REACTIONS

You may see one or more of these signs when a chemical reaction occurs

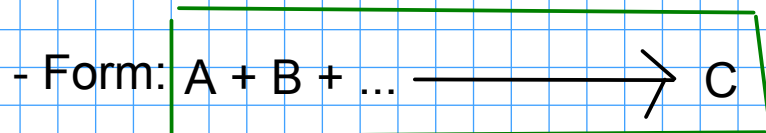
- ① - A change in temperature that can't be explained in another way.
- ② - Emission of light that can't be explained in another way
- ③ - The formation of a solid - or PRECIPITATION - in a previously liquid solution. (Not a simple phase change!)
- ④ - Color change (not simply lightening of color caused by diluting a solution!)

# CLASSIFYING REACTIONS

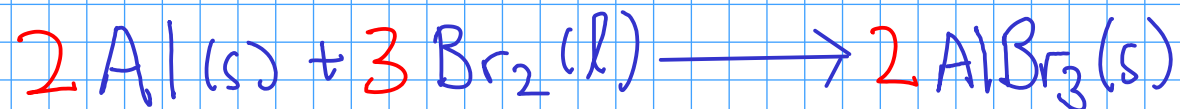
- It's simpler to talk about different reactions if we can classify them into a small number of classes.
- We will discuss five classes of chemical reaction. (You may learn additional ways to classify reactions in more advanced chemistry courses!)

## ① COMBINATION REACTIONS

- Reactions that involve two or more simple substances **COMBINING** to form a **SINGLE** product
- Often involve large energy changes. Sometimes violent!



Example:

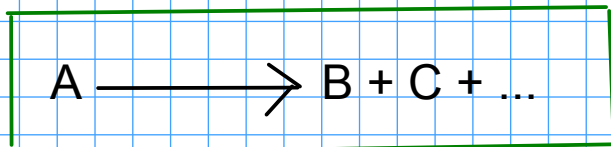


# CLASSIFYING REACTIONS

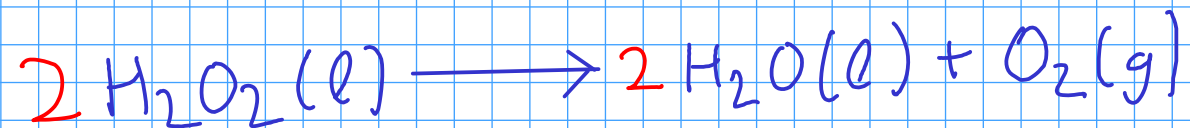
## ② DECOMPOSITION REACTIONS

- Reactions where a SINGLE REACTANT breaks apart into several products

- Form:



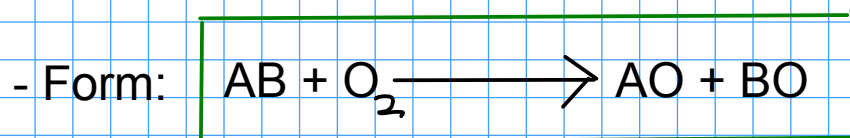
Example:



# CLASSIFYING REACTIONS

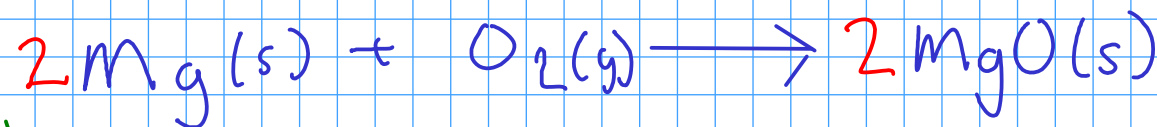
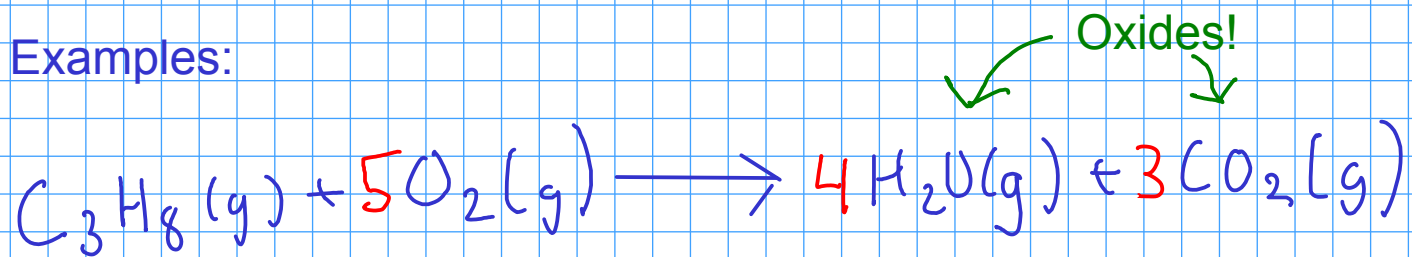
## 3 COMBUSTION REACTIONS

- Reactions of substances with MOLECULAR OXYGEN (  $O_2$  ) to form OXIDES.
- Combustion forms an OXIDE of EACH ELEMENT in the burned substance!



Oxide: a compound containing OXYGEN and one other element!

Examples:

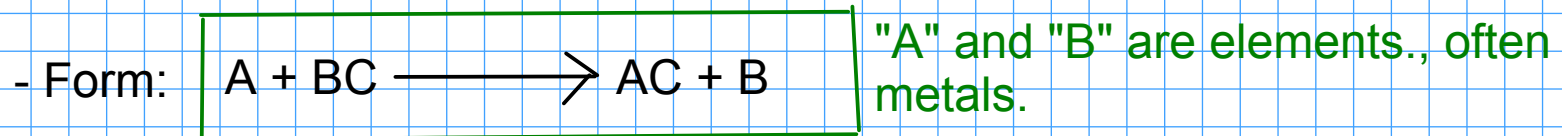


This reaction can also be called a combination!  
Two reactants form a single product.

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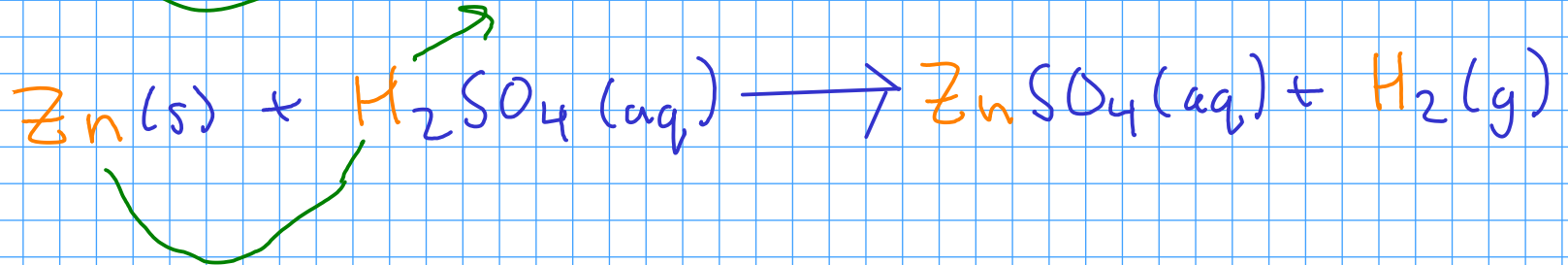
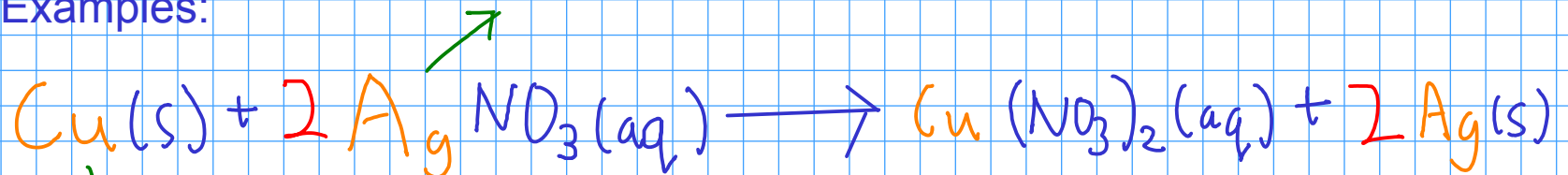
## ④ SINGLE REPLACEMENT REACTIONS

- Reactions where one element REPLACES another element in a compound.
- Can be predicted via an ACTIVITY SERIES (more on that later!)



- Easy to spot, since there is an element "by itself" on each side of the equation.

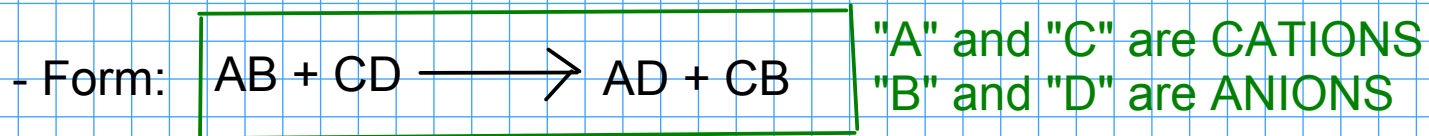
Examples:



# CLASSIFYING REACTIONS

## 5 DOUBLE REPLACEMENT REACTIONS

- Also called "exchange" reactions
- The ions in two ionic compounds (one compound may also be an acid) EXCHANGE PARTNERS, forming two new compounds.



- Can be predicted based on the characteristics of the potential products (More on that later!)
- Occur in AQUEOUS SOLUTION

Examples:

