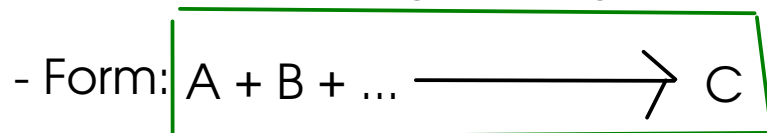


CLASSIFYING REACTIONS

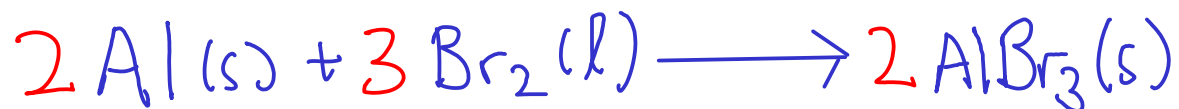
- It's simpler to talk about different reactions if we can classify them into a small number of classes.
- Most of these reaction classes are reactions that involve TRANSFER OF ELECTRONS from one atom to another. The LAST class of reactions we will discuss does NOT involve electron transfer!

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

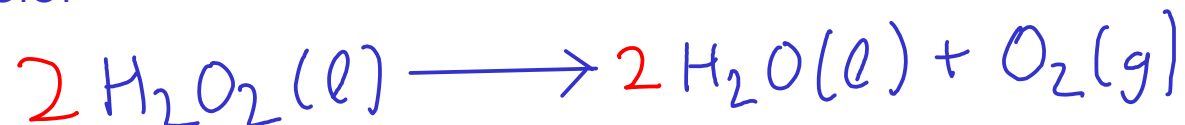
② DECOMPOSITION REACTIONS

- Reactions where a SINGLE REACTANT breaks apart into several products

- Form:



Example:



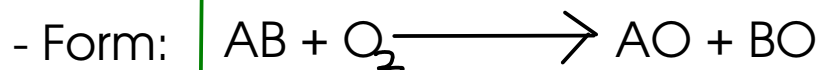
* This reaction is NOT a combustion reaction, even though O_2 is involved!

* Combustion reactions CONSUME O_2 , while this reaction PRODUCES O_2

CLASSIFYING REACTIONS

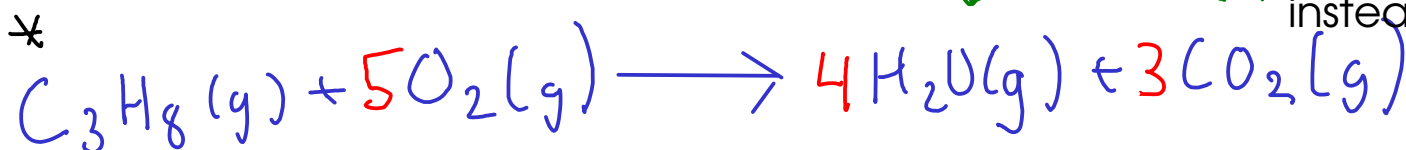
3 COMBUSTION REACTIONS

- 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:



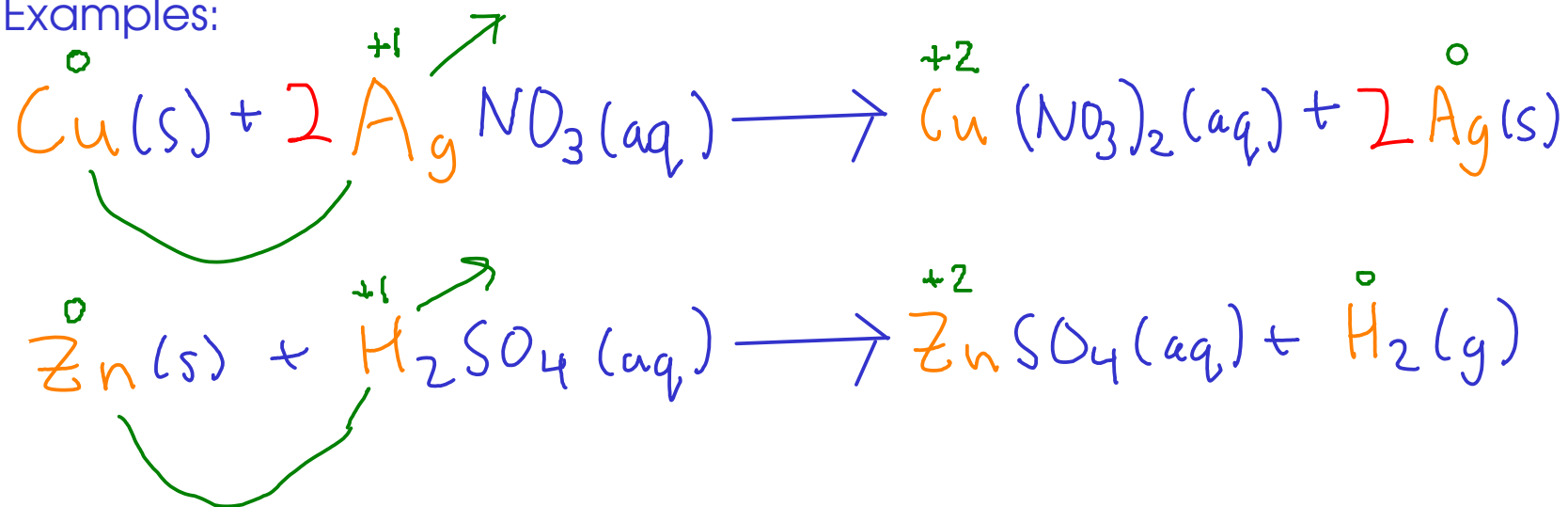
* Combustion of hydrocarbons makes carbon dioxide and water, if enough oxygen is present. In low-oxygen environments, carbon monoxide is made instead!

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

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!)
- Form: $A + BC \longrightarrow AC + B$ "A" and "B" are elements, often metals.
- Easy to spot, since there is an element "by itself" on each side of the equation.

Examples:

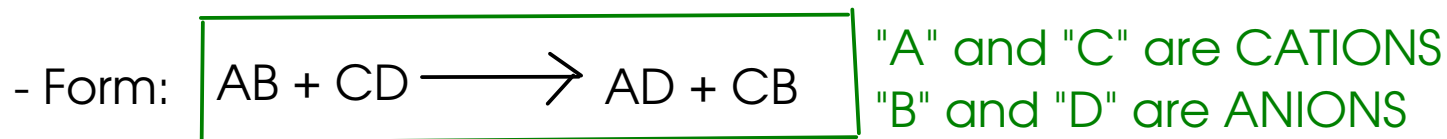


* Single replacement reactions are all examples of ELECTRON TRANSFER or OXIDATION-REDUCTION chemistry!

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
- Do not involve electron transfer.

Examples:

