**Types of Chemical Change**

There are many, many, many types of chemical reactions—we will attempt to classify some of them.

**1) Synthesis—Addition—Combination—Composition…**

**2) Decomposition**

**3) Single Displacement—Single Replacement**

**4) Double Displacement—Double Displacement**

**5) Precipitation—Double Displacement**

**6) Acid—Base Neutralization—Double Displacement**

 A = \_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_\_

 B = \_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_\_

 S = \_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_\_

 W = \_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_\_ AKA \_\_\_\_\_\_\_\_\_\_\_\_\_

**A + B 🡪 S + W**

 Write neutralization reactions for the following:

1. HF(aq) + KOH(aq) 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. H2SO4(aq) + Mg(OH)2(aq) 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. HBr(aq) + Ca(OH)2(aq) 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**7) Oxidation—Reduction Reactions**

* A chemical change involving oxygen or a substance with properties similar to oxygen
* A chemical change where electrons are transferred from one species to another species
* These reactions keep us alive!!!!! (cellular respiration) and…age our cells so we die!!!!!
* e.g. metals rusting, foods rotting, **fossil fuels** burning

**Cellular Respiration**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 **BBQ Propane Combusting**

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* the presence of humidity ( ) increases the rate of rusting
* light E increases the rate of oxidation of oils = rancid = funny taste
* galvanization = coating of iron with zinc = the zinc oxidizes first protecting the iron
* antioxidants in fruits and veggies = slow down the aging of cells, maybe = eat up!
* Chitin from crustaceans’ shells can stick to metals and prevent rusting

**8) Combustion**

* A form of oxidation that releases large amounts of energy = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Burning wood, cellular respiration (burning sugar), burning fossil fuels
* Fossil fuels are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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* Contributes to global warming via the Green House Effect (GHE)
* GHE = normal phenomenon = keeps us warm = allows us to grow food
* Too much of a good thing is a bad thing!!! Moderation in life is key!!!!
* GHE = CO2(g) acts as a “blankie” that absorbs heat energy that reflects (bounces) off the Earth back into space
* If not enough oxygen then you have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ combustion
* Therefore carbon monoxide detectors are needed
* Fossil fuels contain sulfur impurities so when they FF burn they also produce SO2

which leads to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* The fire triangle must be obeyed = 3 parts to start a fire
* Oxidizing agent (oxidizer) + fuel + ignition temperature (min. T at which sufficient E is present to start combustion
* 3 types of combustion = rapid, spontaneous and slow

Rapid Combustion

* Short period of time
* Large amounts of heat and light E
* Burning