Organic Reactions (part 1)

1. Substitution Reactions
    - Slow reaction with by product
    - Alkanes, cycloalkanes
    - Benzene rings (aromatics)

Examples:

ethane (CH_3CH_3) + bromine (Br_2) → bromoethane (CH_3CH_2Br) + hydrobromic acid (HBr)

Benzene + Chorine → chlorobenzene + hydrochloric acid

toluene + nitric acid → 2-nitrotoluene + water

2-nitrotoluene + nitric acid → 2,4-dinitrotoluene + water
2,4-dinitrotoluene + nitric acid → 2,4,6-trinitrotoluene + water

2. Addition Reactions

- A double and triple bonds are highly reactive and can be easily broken and additional atoms added.
- Good tests for saturated and unsaturated fats

    - Halogenation

ethene + bromine → 1,2-dibromoethane

    - Hydrogenation (Need platinum catalyst)

ethyne + hydrogen → ethane

Markovnikov's Rule: ("the rich get richer") When a hydrogen halide or water is added to an alkene or alkyne, the hydrogen bonds to the carbon atom within the double bond that already has more hydrogen atoms.

a. Hydrohalogenation

propene + hydrogen bromide → 2-bromopropane

b. Hydration

propene + water → 2-propanol

3. Elimination Reactions
   - Used to form alkenes
   - Need a strong base

2-chloropropane + sodium hydroxide → propene + water + sodium chloride