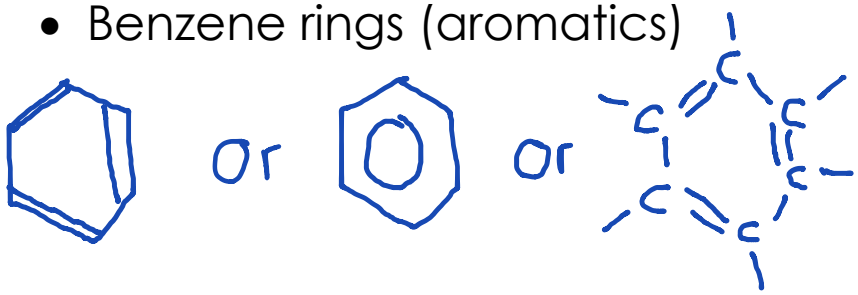
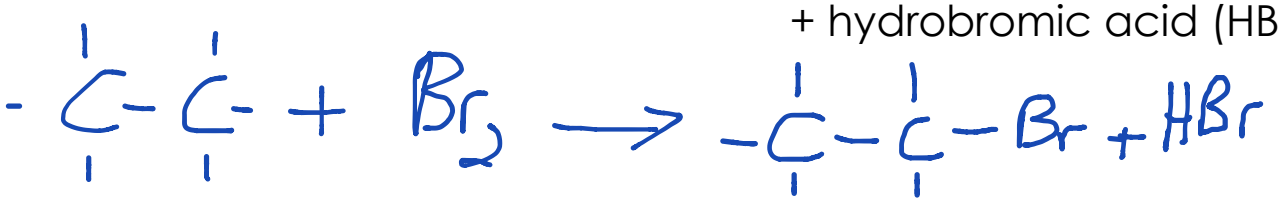
Organic Reactions (part 1)

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

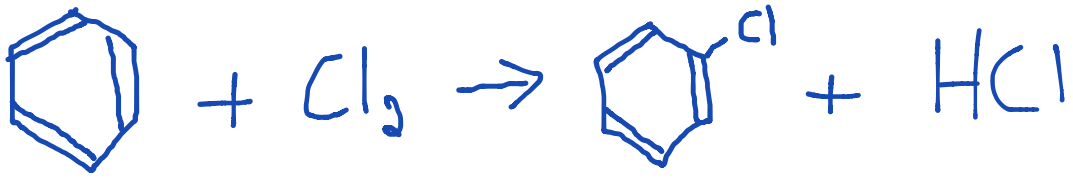


Examples:

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



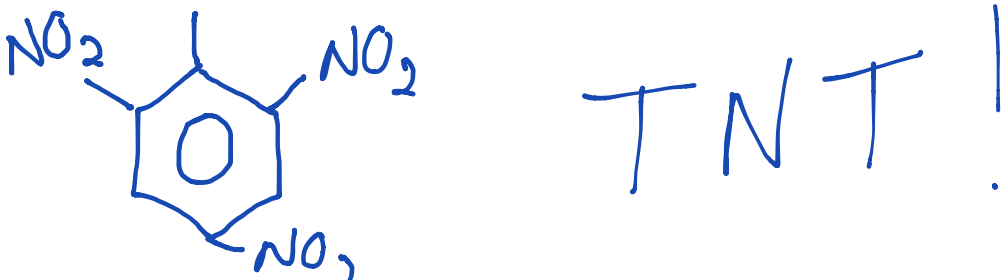
Benzene + Chorine → chlorobenzene + hydrochloric acid



toluene + nitric acid → 2-nitrotoluene + water

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

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

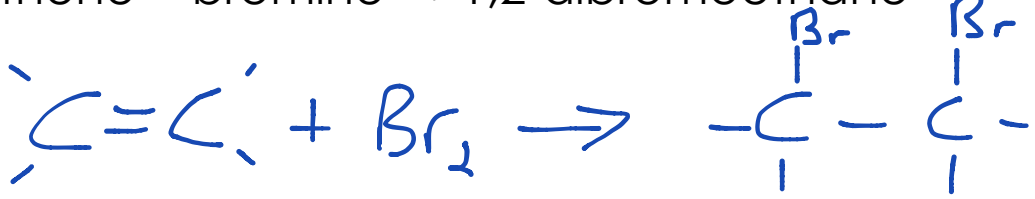


2. Addition Reactions fast, No by product

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

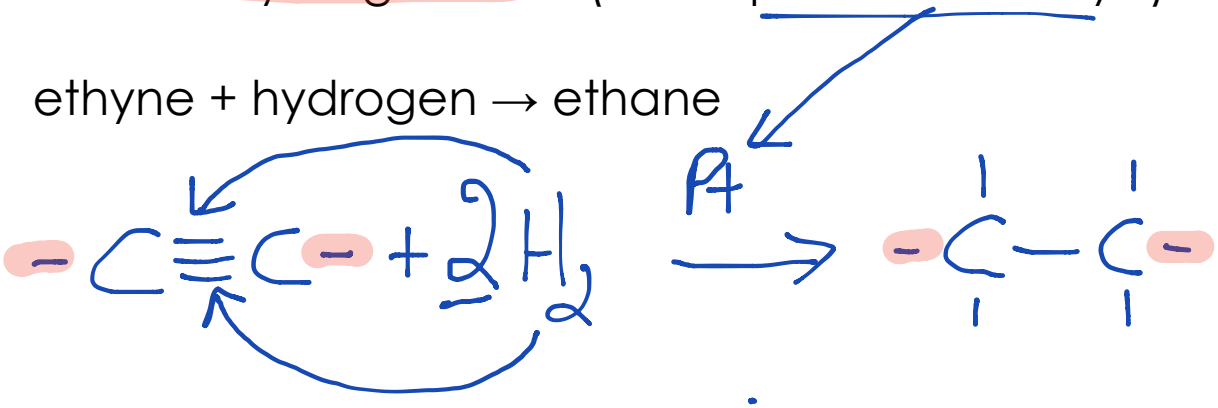
- Halogenation

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.

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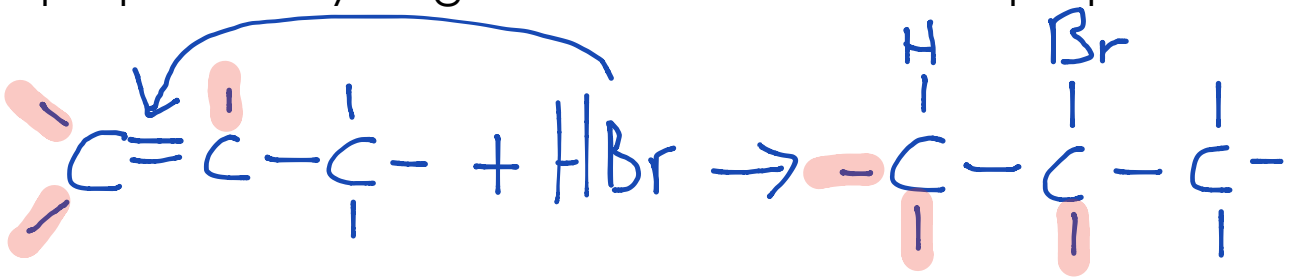
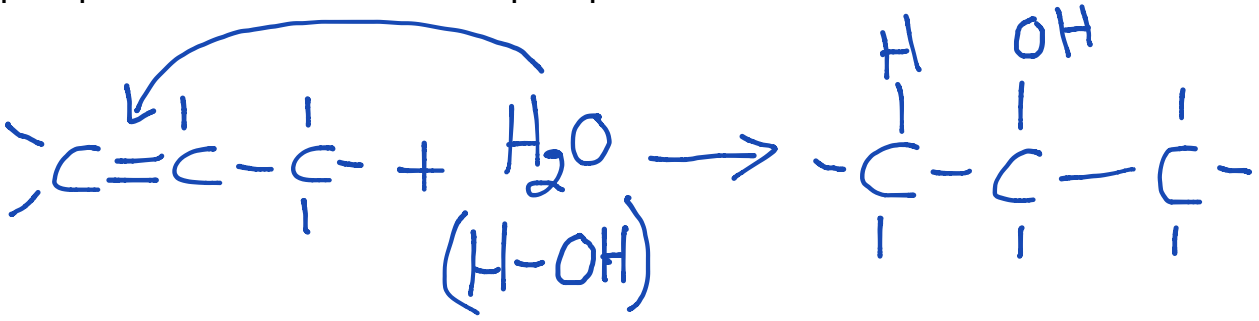
a.Hydrohalogenation

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