Summary of Organic Compounds- Functional Groups and Reactions

Family	Functional Group	Formed from:	Reaction types	Reacts with
Alkanes, cycloalkanes	C-C	Hydrogenation of alkenes and alkynes	Substitution	Halogens
Alkenes, cycloalkenes Alkynes	C=C C≡C	Dehydration of alcohols	Addition	• Halogens (halogenation) to form alkyl halides • Hydrogen (hydrogenation) to form alkanes • Hydrogen halide (hydrohalogenation) to form alkyl halides • Water (hydration) to form alcohols
Aromatics			Substitution	• Halogens (halogenation) to form alkyl halides
Alkyl halides	C-X where X = halogen	Halogenation of hydrocarbons		
Alcohols	C-OH	Hydration of alkenes, alkynes Hydrogenation of aldehydes	Elimination Condensation	• Water removed (dehydration) • Active oxygen (controlled oxidation) to form aldehydes and ketones • Alcohol + alcohol = ether + H_2O
Ethers	C-O-C	Condensation of alcohols		
Aldehydes, ketones	C=O	Controlled oxidation of alcohols	Addition	• Hydrogen (hydrogenation) to form alcohols • Controlled oxidation of aldehydes to form carboxylic acids
Carboxylic acids	C=O | OH	Controlled oxidation of aldehydes	Condensation	• Carboxylic acid + alcohol = ester + H_2O
Esters	C-O-C=O | OH	Carboxylic acid and alcohol		