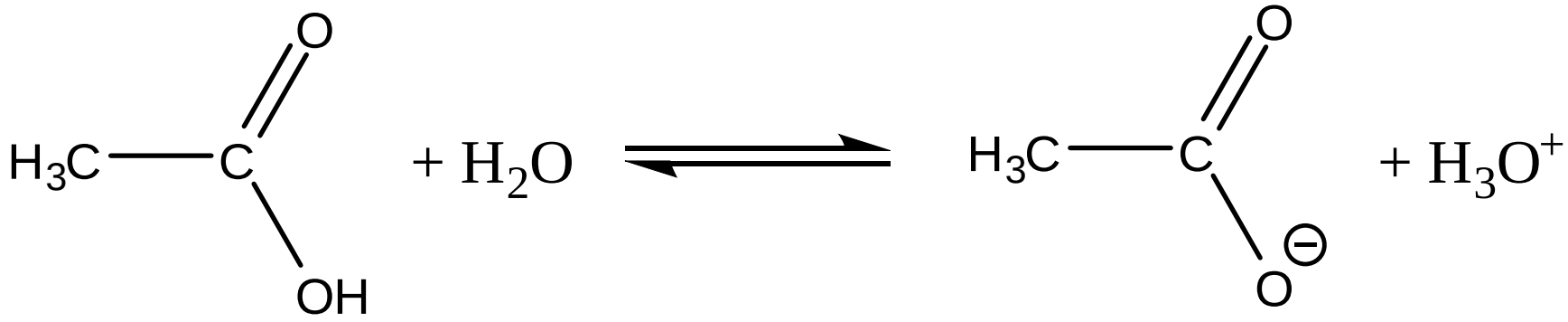
Chemistry 3.5
Advanced Organic Chemistry

Carboxylic acid and Acyl Chloride

Carboxylic acid

- It is a weak acid
- It partially dissociates in water forming an equilibrium between the acid and carboxylate

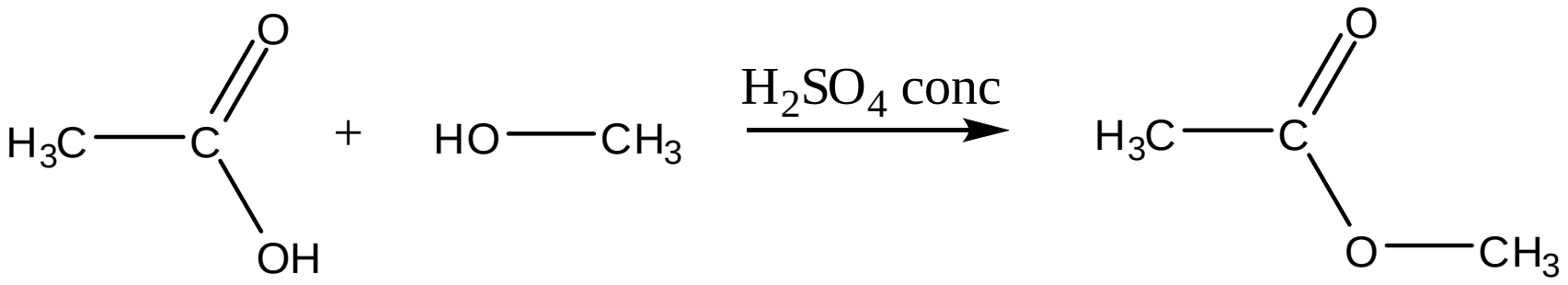


Ethanoic acid

Ethanoate ion

Condensation reaction

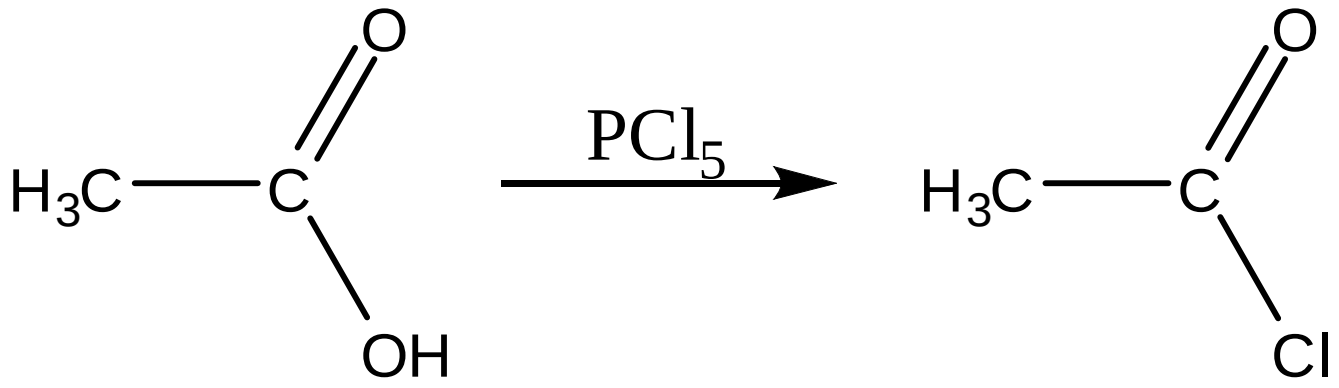
- Carboxylic acid can also react with alcohol forming Esters



Ethanoic acid Methanol Methyl ethanoate

Substitution

- It can form acyl chloride when it reacts with PCl_5

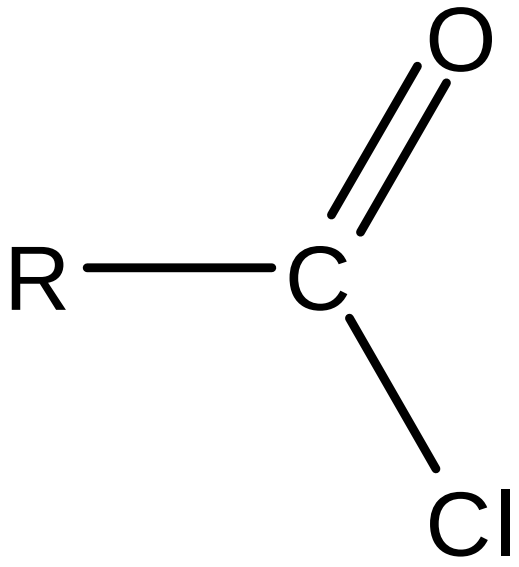


Ethanoic acid

Ethanoyl chloride

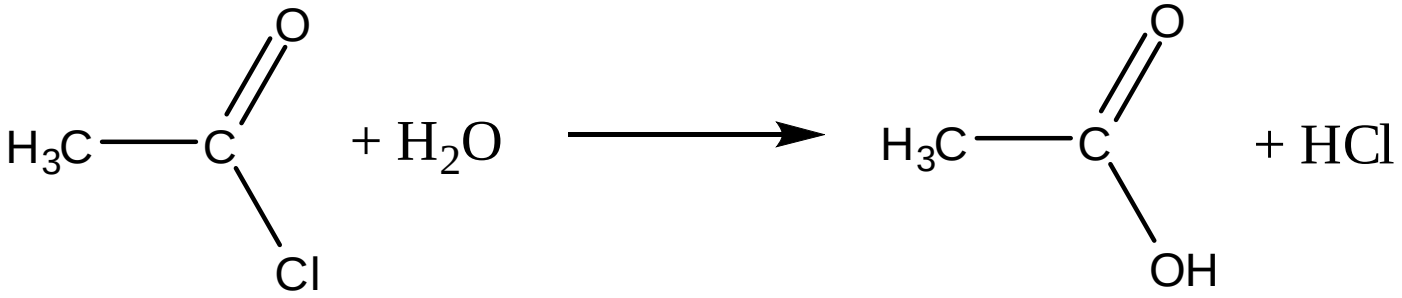
Acyl Chloride

- Suffix anoyl chloride
- Very reactive molecules

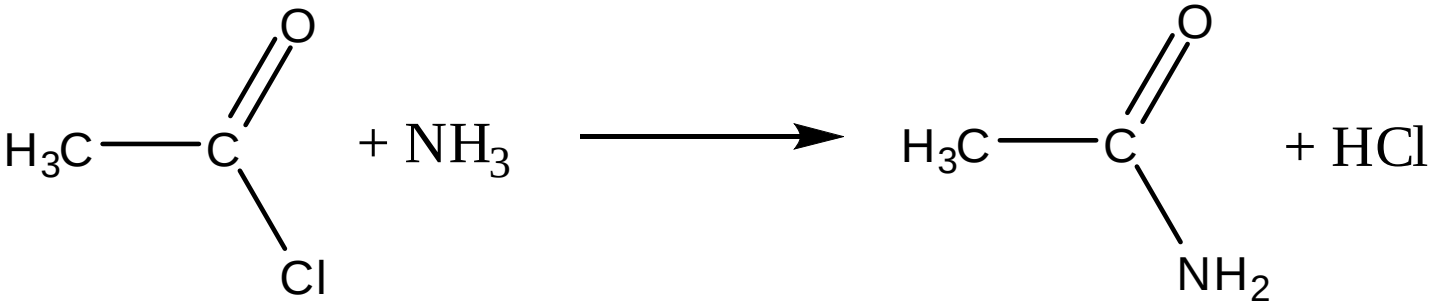


Substitution reaction

- Acyl chloride reacts with **water** violently by substitution
- Carboxylic acid is form as well as HCl gas



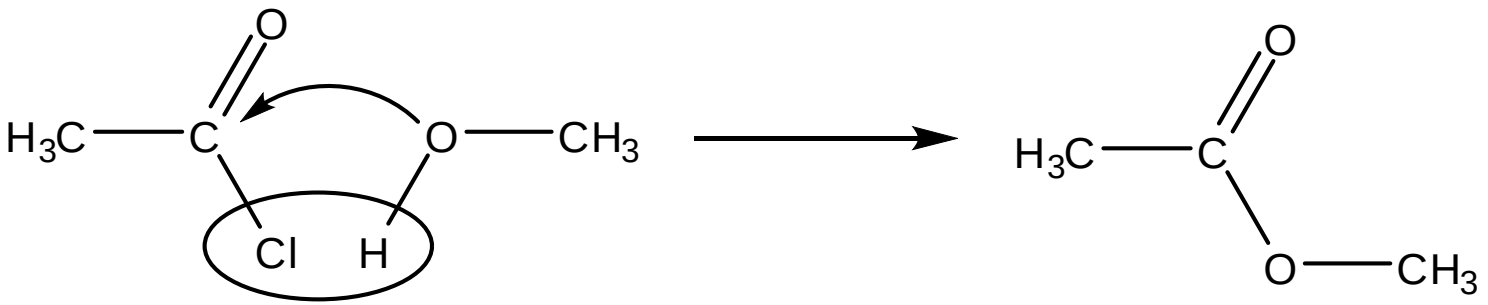
- Amide is formed when it reacts with NH_3 (g)



Condensation

- Similar to carboxylic acid, acyl chloride can undergo condensation reaction
- Because of its reactivity, it does not require any external reagent

- Acyl chloride + Alcohol → Ester + HCl



- Acyl chloride + Amine → Amide + HCl