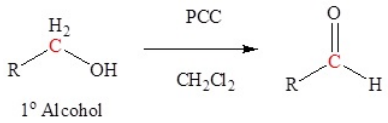
19.14: Preparation of Aldehydes and Ketones

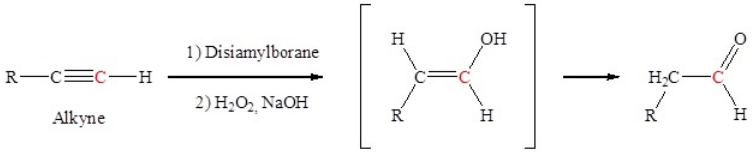
Aldehydes and ketones can be prepared using a wide variety of reactions. Although these reactions are discussed in greater detail in other sections, they are listed here as a summary and to help with planning multistep synthetic pathways. Please use the appropriate links to see more details about the reactions.

Oxidation of 1^o alcohols with PCC to form aldehydes

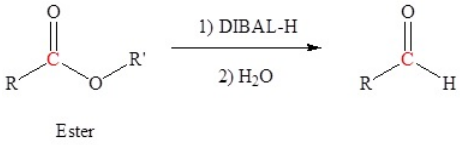


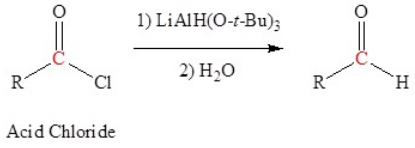
Hydration of an alkyne to form aldehydes

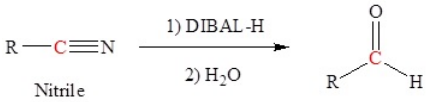
Anti-Markovnikov addition of a hydroxyl group to an alkyne forms an aldehyde. The addition of a hydroxyl group to an alkyne causes tautomerization which subsequently forms a carbonyl.



Reduction of an ester, acid chloride or nitrile to form aldehydes

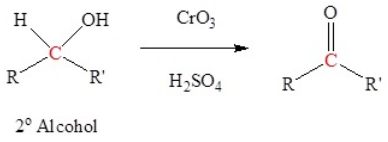






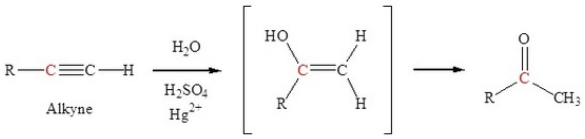
Oxidation of 2^o alcohols to form ketones

Typically uses Jones reagent (CrO_3 in H_2SO_4) but many other reagents can be used

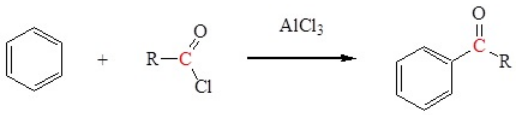


Hydration of an alkyne to form ketones

The addition of a hydroxyl group to an alkyne causes tautomerization which subsequently forms a carbonyl. Markovnikov addition of a hydroxyl group to an alkyne forms a ketone.

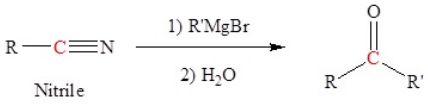


Friedel-Crafts acylation to form a ketone

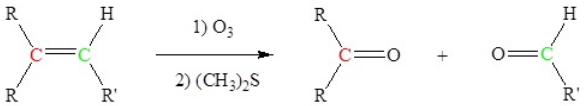


Acid Chloride

Reaction of Grignard reagents with nitriles to form ketones



Alkenes can be cleaved using ozone (O_3) to form aldehydes and/or ketones



Alkene

This is an example of a Ozonolysis reaction.

Contributors

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