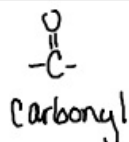


12/4/18

Aldehydes + Ketones



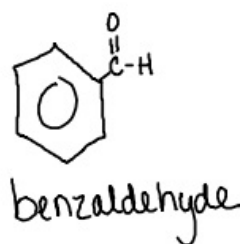
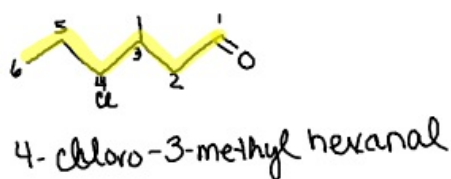
Aldehyde - carbonyl is on a terminal carbon

Ketone - carbonyl is on an interior carbon

Nomenclature:

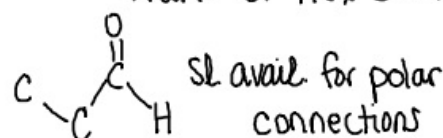
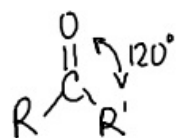
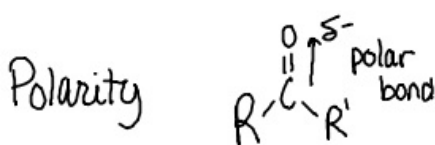
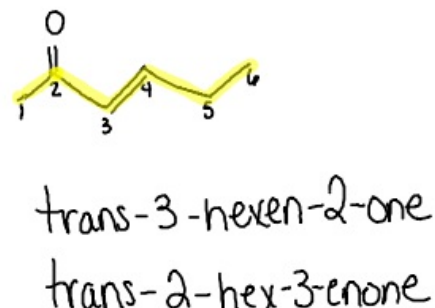
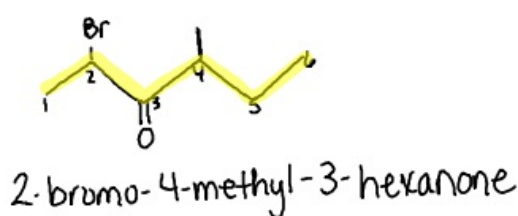
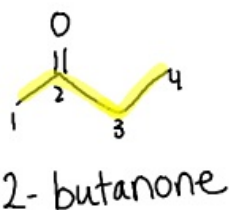
Aldehydes:

IUPAC - parent name followed by -al
use locator # for any substituents.

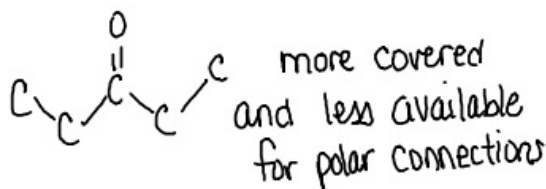


Ketones:

IUPAC - parent name followed by -one, # giving precedence to the carbonyl.
use locator # for any substituents.

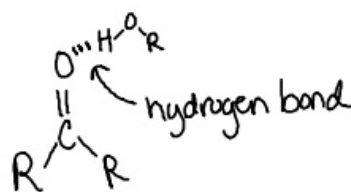


aldehydes will react slightly easier than ketones.



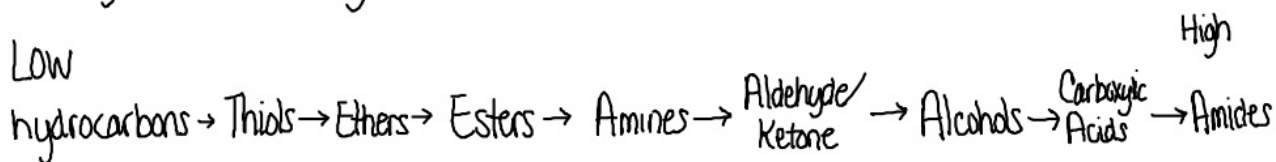
Both have a weak dipole area for intermolecular bonding.

Both can form hydrogen bonds with H₂O & other hydroxyls.



Boiling Points / Solubility:

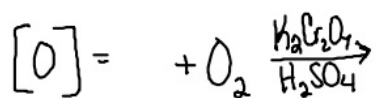
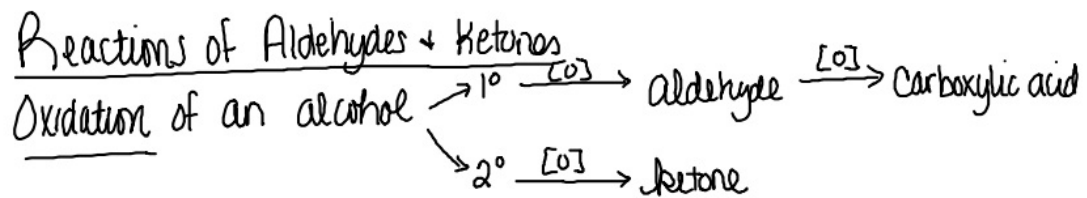
Low



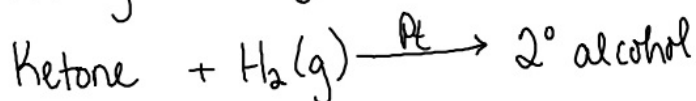
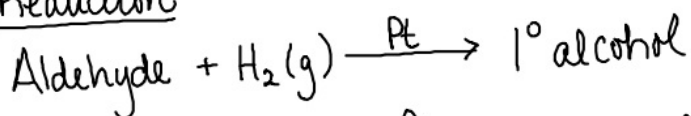
Aldehydes have a very sharp/irritating odor

Ketones have a sweet or pleasant odor

Reactions of Aldehydes + Ketones



Reduction



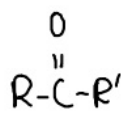
Oxidizing Reagents: Dichromate, Tollen's, Benedict's, Iodoform

Reducing Reagents: Lithium Aluminum Hydride, Sodium Borohydride

12/4/18 Aldehydes & Ketones

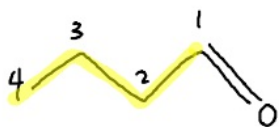
Aldehyde - contains a terminal carbonyl $R-\overset{\overset{O}{\parallel}}{C}-H$

Ketones - interior carbonyl, requires a locator



Nomenclature

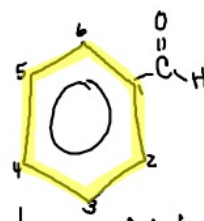
IUPAC: Aldehyde - name parent chain, remove the "e" and add "al"
Substituents require a locator #



butanal
2



5-Fluoro-3-methylhexanal

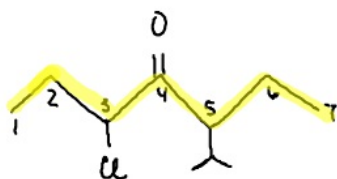


benzaldehyde

Ketones - name the parent chain, remove the "e" add "one" with a # locator
Carbonyl has precedence over other substituents when numbering. Use locator # for other substituents.



2-hexanone



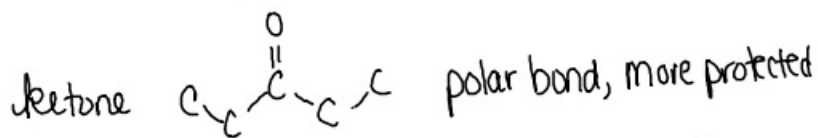
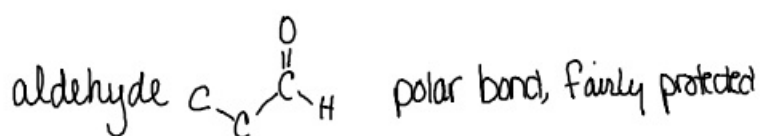
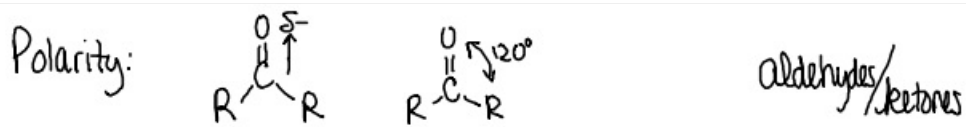
3-chloro-5-isopropyl-4-heptanone



1,3-cyclopentandione

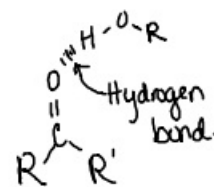


Cis-3-hepten-6-one



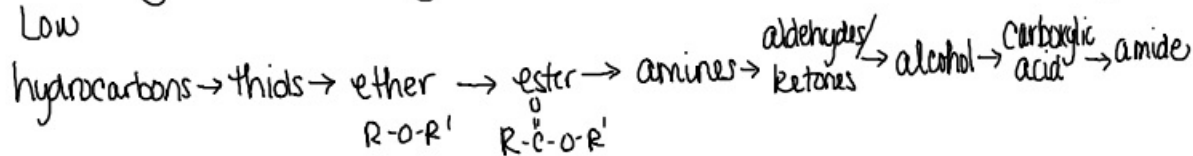
both have a weak dipole area for bonding

both can make hydrogen bonds w/ hydroxyls + water



Boiling Point/Solubility:

Low

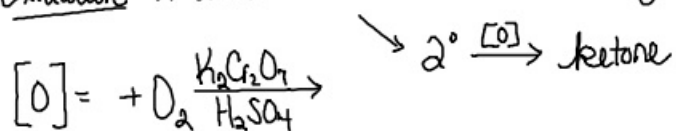
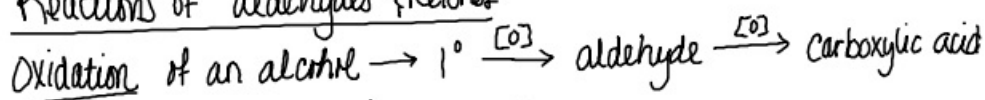


High

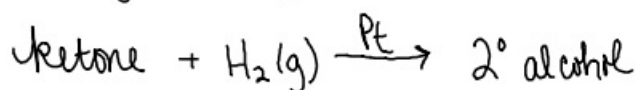
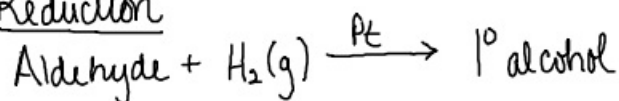
aldehydes: pungent, irritating odor

ketones: smell pleasant, sweet

Reactions of aldehydes & Ketones

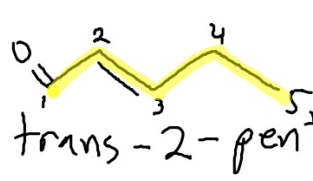


Reduction



Oxidizing Reagents: Dichromate, Tollen's, Benedict's, Iodoform

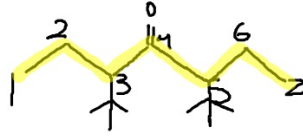
Reducing Reagents: Lithium Aluminum hydride, Sodium borohydride



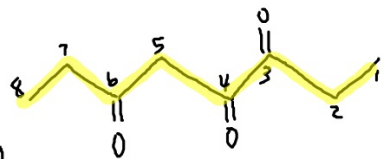
trans-2-pentenal



cycloheptanone



3,5-dit-butyl
-4-heptanone



3,4,6-octanetrione

