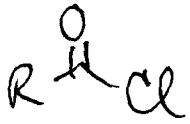
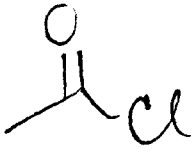
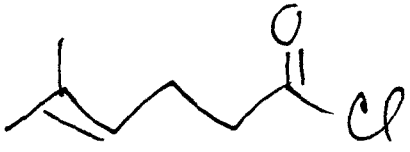
Acid chlorides (acyl chlorides)



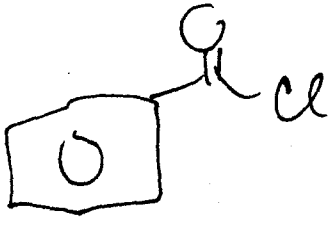
name parent acid
replace "ic acid" with "yl chloride"



acetyl chloride



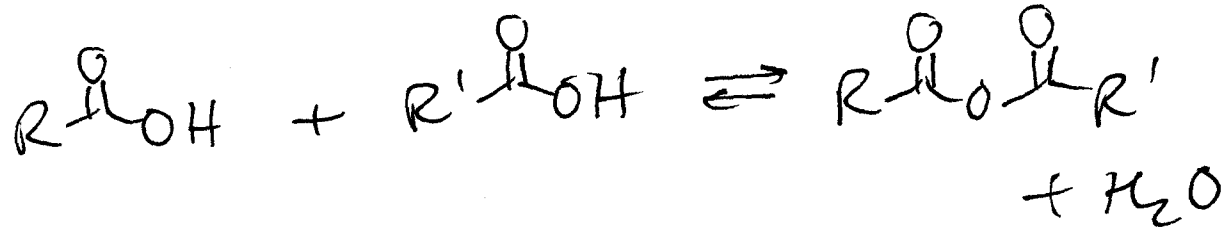
5-methyl-4-hexenoyl chloride



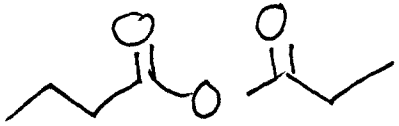
benzoyl chloride

* NOT benzyl chloride → 

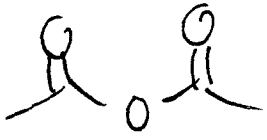
Anhydrides



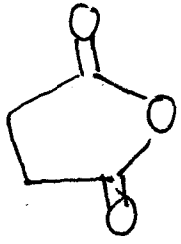
name <u>both</u> parent acids
replace "acid" with "anhydride"



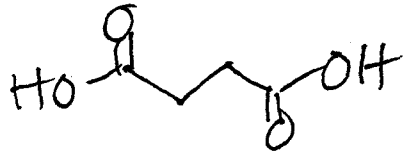
butanoic propanoic anhydride



acetic anhydride

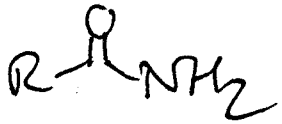


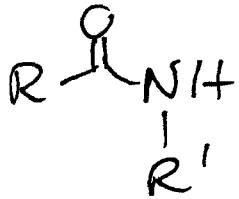
succinic anhydride – from

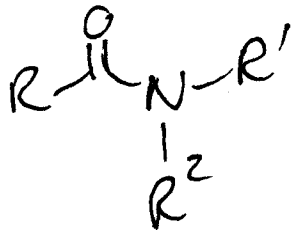


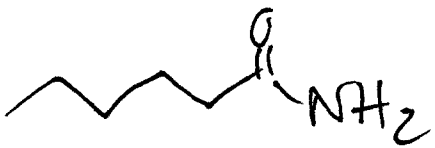
succinic acid

Amides

1° 

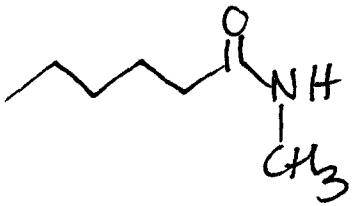
2° 

3° 



hexanamide

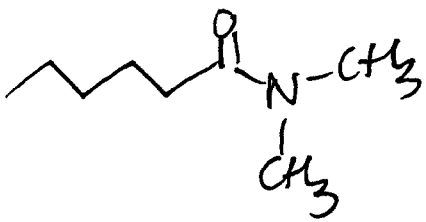
"oic acid"
⇒ "amide"



hexanamide

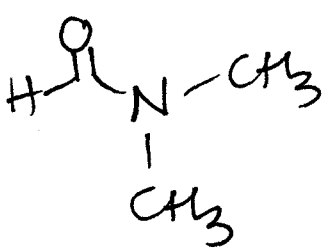
BUT –
what about
the CH_3?

N-methylhexanamide

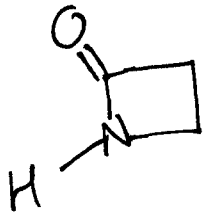


N,N-dimethylhexanamide

DMF
N,N-dimethylformamide

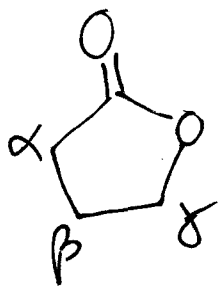


cyclic amides are called <u>lactams</u>



a β-lactam

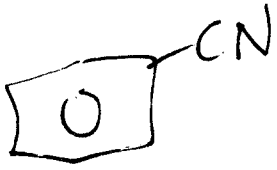
cyclic esters are called <u>lactones</u>



a γ lactone

Nitriles – are considered derivatives of carboxylic acids

pentanonitrile



benzonitrile

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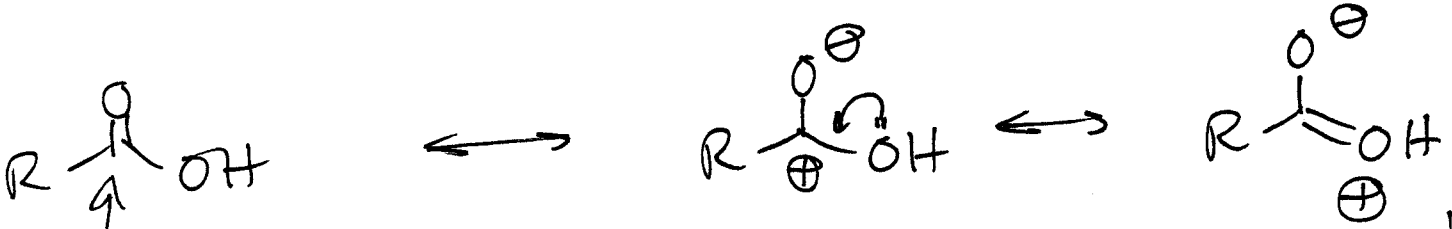
structural features



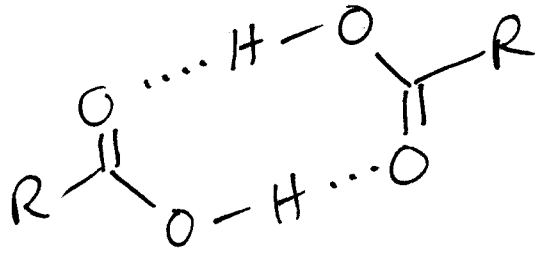
sp^2

120° bond angles

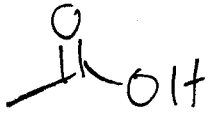
explains why carbonyls are susceptible to nucleophilic attack

explains why acids + derivs are less reactive than ald. or ketones

carboxylic acids can form H-bond pairs



increases both mp + bp



MW $C_2H_4O_2$

$$\begin{array}{r} 24+4+32 \\ 28 \\ \hline 60 \end{array} \quad = 60\ g/mol$$

Look at derivatives – e' donation from the substituent stabilizes the C=O, making it less susceptible to nucleophilic attack.
(the more stabilized the C=O, the less reactive)

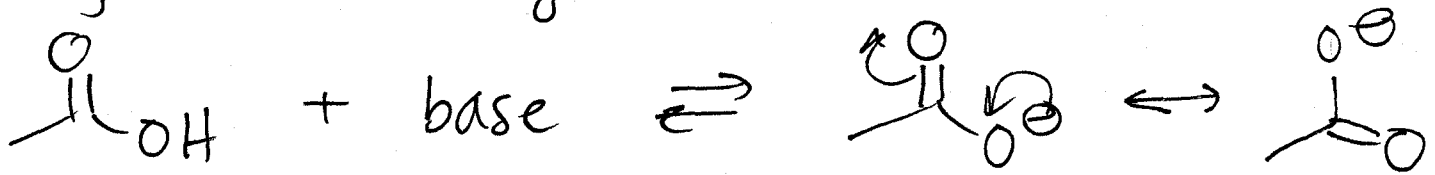
not a great e' donor

good donor but shared by two C=O's

good donor

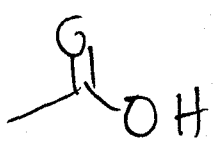
less e' neg than oxygen better donor

Acidity of carboxylic acids

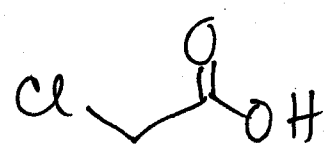


resonance stabilization

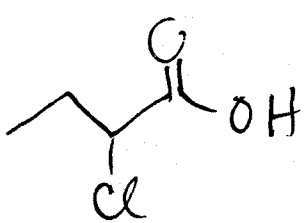
e⁻neg substituents (e⁻ withdrawers) close to OH will stabilize the corresponding anion by induction. ⇒ increased acidity.



pKa 4.7



2.9



vs.