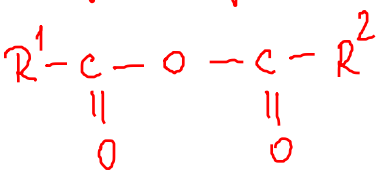
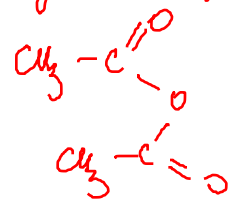
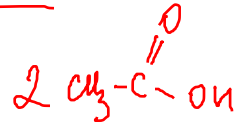
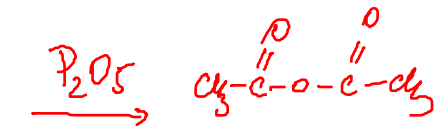
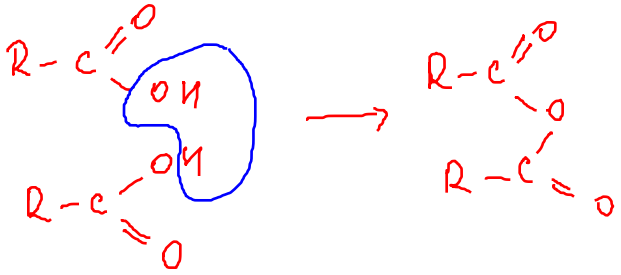
Anhydridy karboxylových kyselin

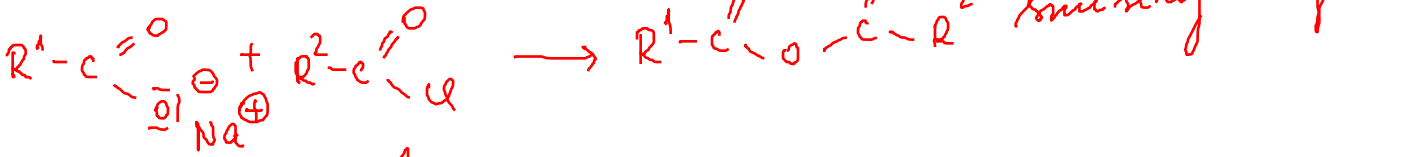






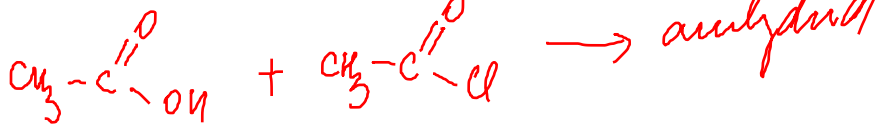


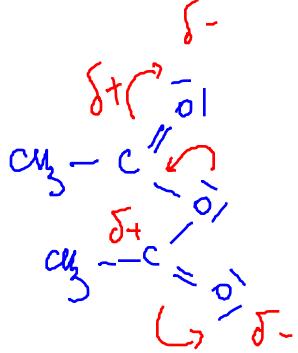


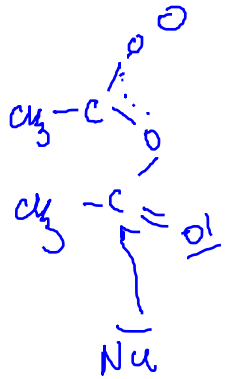


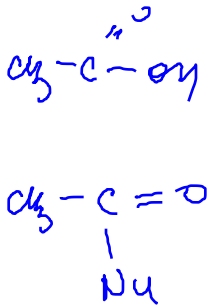
anhydrid kys. octové

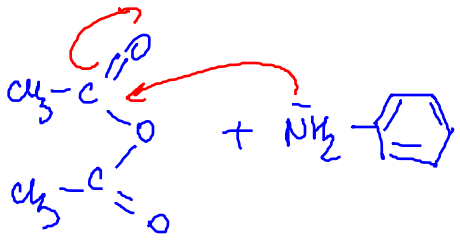
—"— benzoové

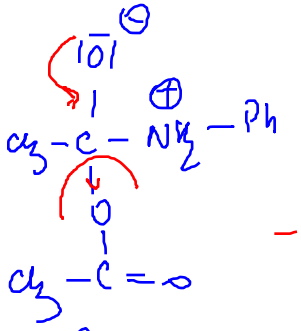


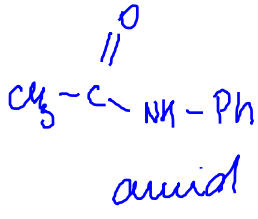






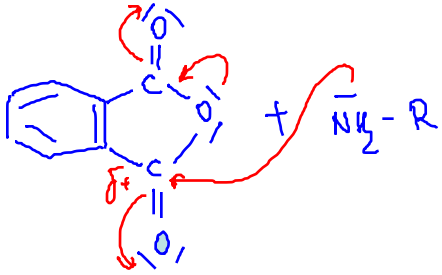


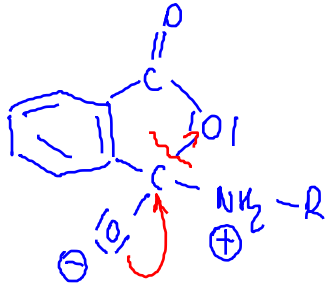


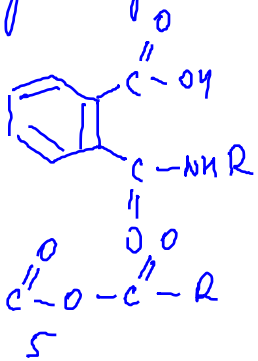


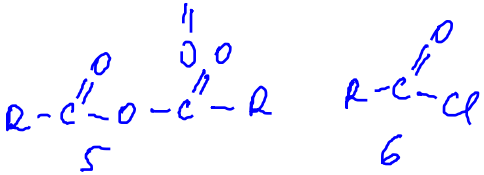
amid

využití jedné části molekuly









R-COOH
1

R-COOR
2

R-CONH$_2$
3

R-COO$^\ominus$
4

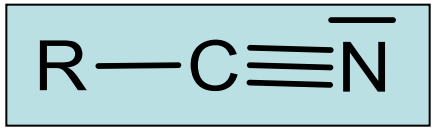
5

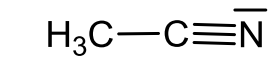
6

reaktivita vůči nukleofilnímu útoku

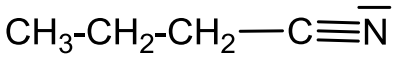
6 > 5 > 2 > 3 > 4 > 1

NITRILES AND ISOCYANIDES

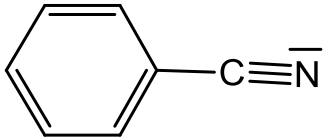




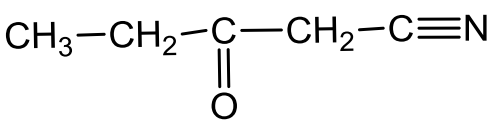
ethannitrile, acetonitrile



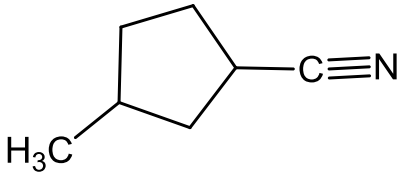
butannitrile



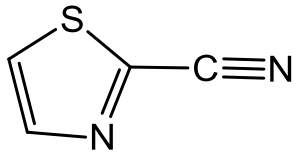
benzonitrile, benzoic acid nitrile



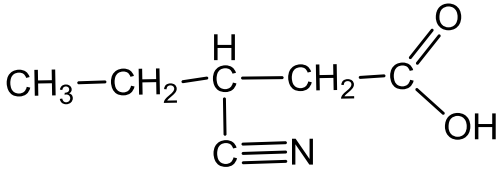
3-oxo-pentannitrile



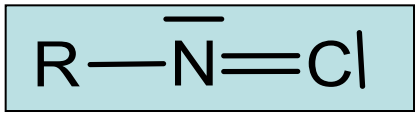
3-methylcyclopentane carbonitrile



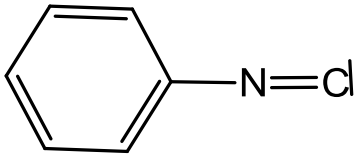
thiazole-2-carbonitrile

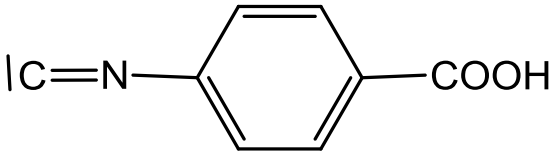


3-cyano-pentanoic acid



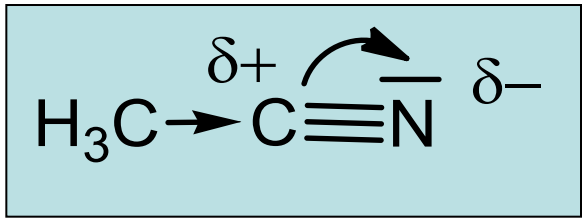
phenylisocyanide





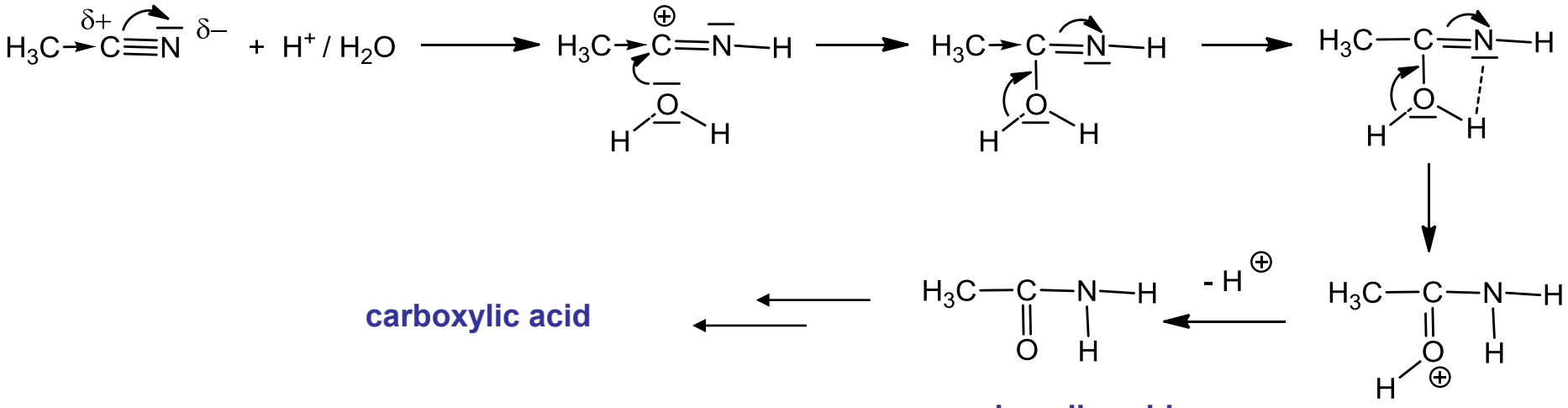
4-isocyanobenzoic acid

NITRILES AND ISOCYANIDES



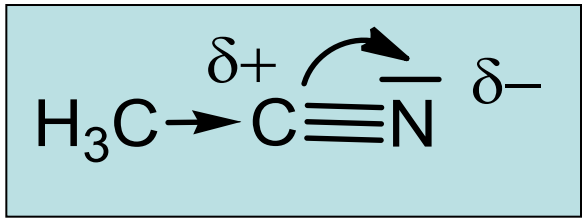
REACTIVITY:

1) **activation of the triple bond by the attack of electrophile at N atom followed by nucleophilic attack at carbon atom**
2) a strong nucleophile is able to attack carbon atom directly
3) acidic hydrogen atom in α-position



hydrolysis is carried out at higher temperature mostly by conc. H_2SO_4

NITRILES AND ISOCYANIDES



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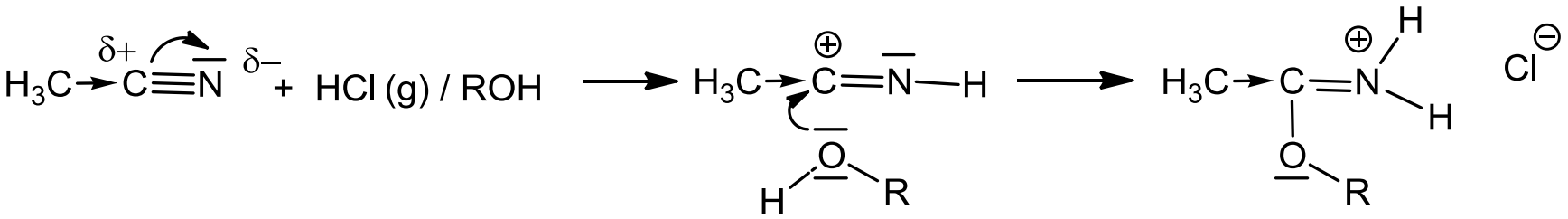
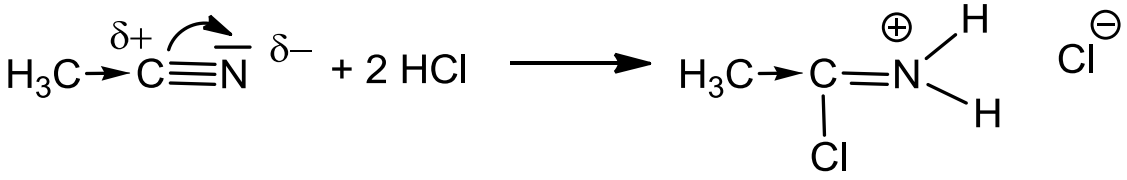
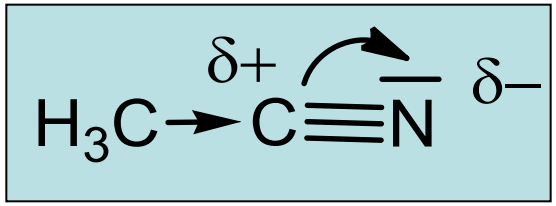


iminoether hydrochloride



iminochloride hydrochloride

NITRILES AND ISOCYANIDES



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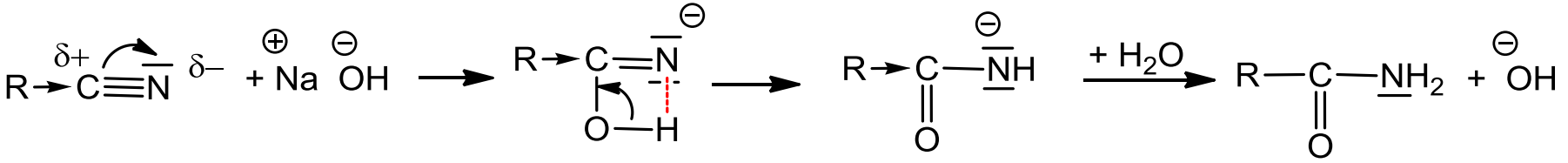
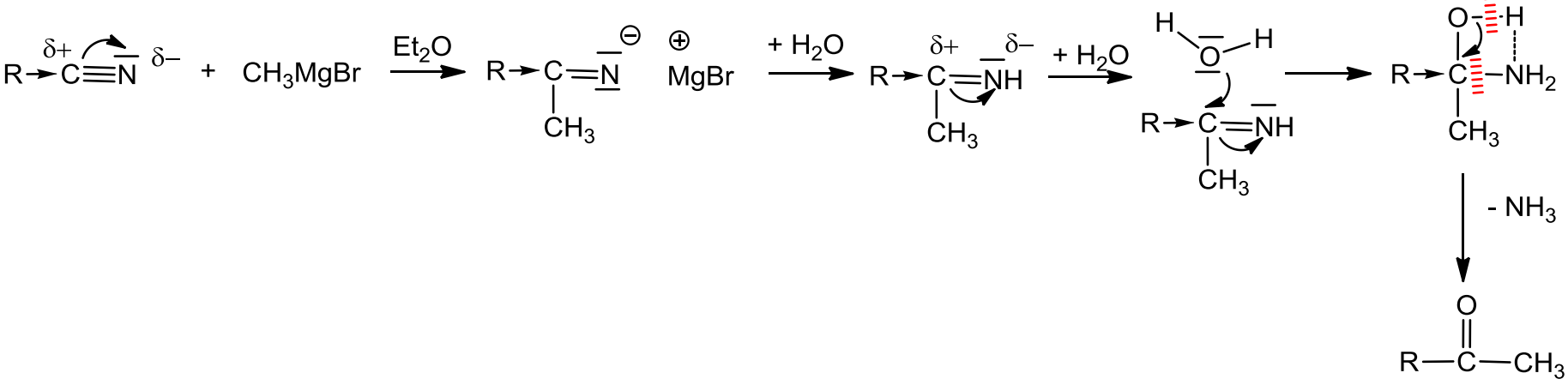
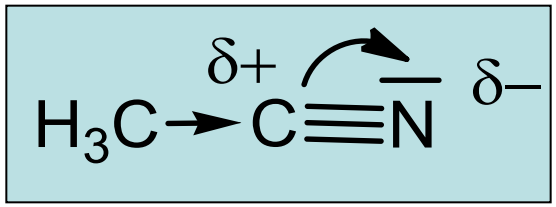




NITRILES AND ISOCYANIDES



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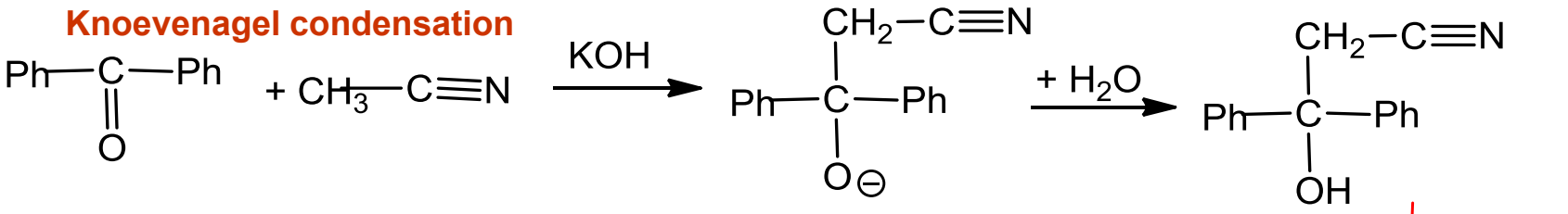
2) a strong nucleophile is able to attack carbon atom directly
3) **acidic hydrogen atom in α-position**

$pK_a = 25$

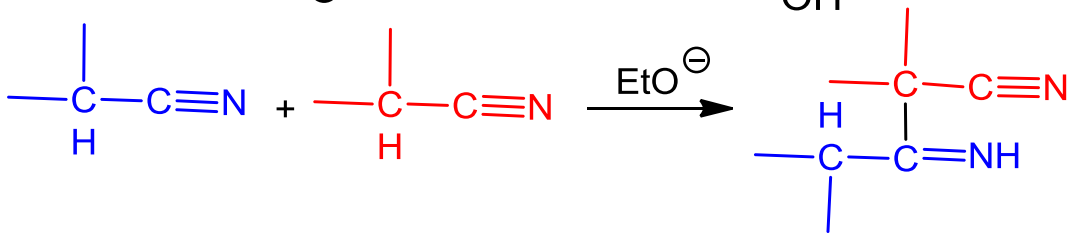
condensation with aldehydes and ketones

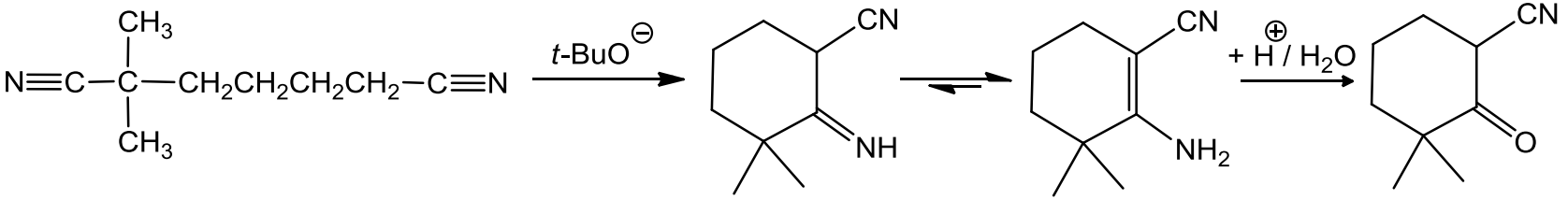
Knoevenagel condensation



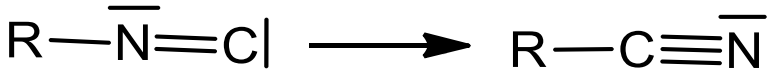
condensation with another nitrile

Thorpe-Ziegler reaction



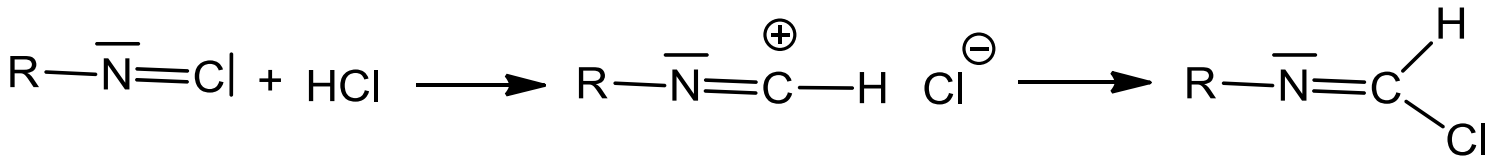


NITRILES AND ISOCYANIDES



poisons and teribly smelling compounds

react with electrophiles at carbon atom



formic acid derivatives

„isonitril“ test – a proof of amino group in biological material