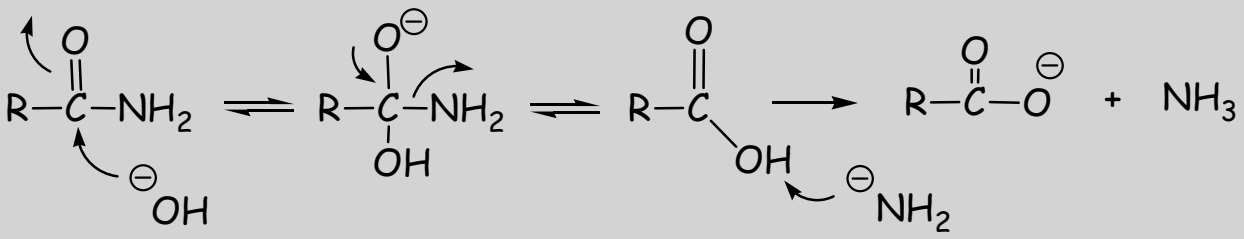
Hydrolysis of Acyl Derivatives

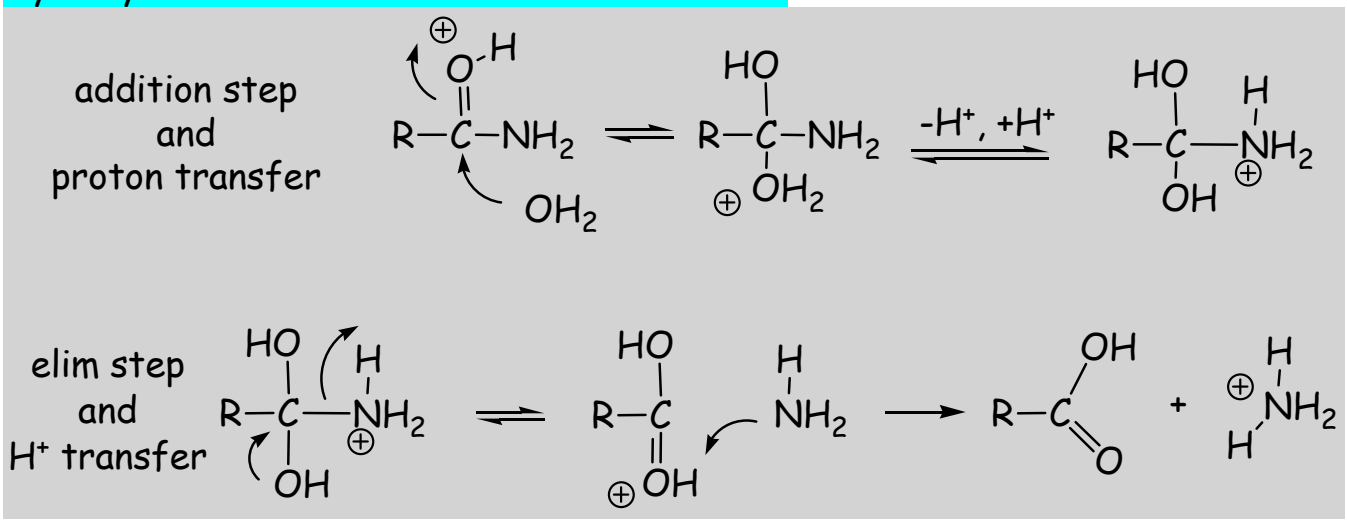
- Recognize hydrolysis as acyl substitution (by water)
- May occur under acid, base or neutral conditions

Hydrolysis of amides under basic conditions:



The final step is essentially irreversible

Hydrolysis of amides under acidic conditions:



Acid hydrolysis occurs under milder conditions since NH_3 is a better leaving group than amide ion, NH_2^-

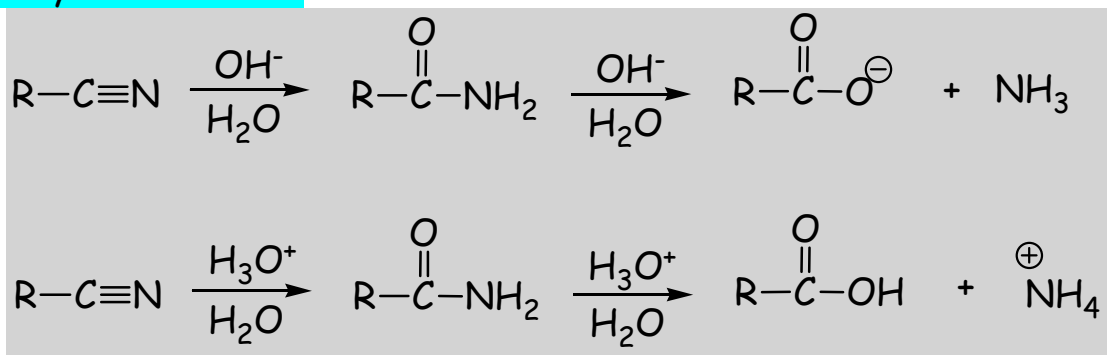
Notice the correspondence between amides and esters:

- Hydrolysis under basic conditions gives the carboxylate ion
- Hydrolysis under acid conditions gives the carboxylic acid

- Under basic conditions- strong nucleophile (hydroxide ion)
- Under basic conditions- weak nucleophile (water)

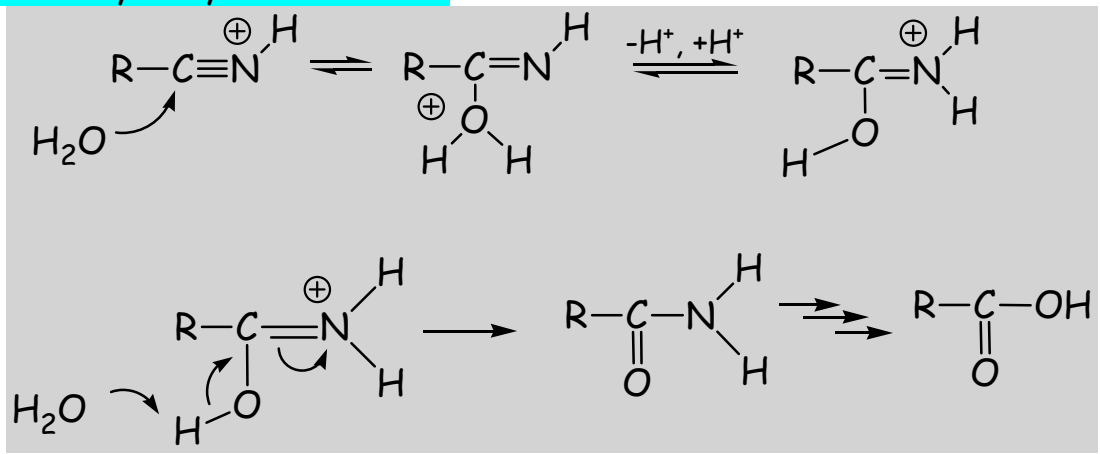
If you can hydrolyze esters, then you can draw mechanism for amide hydrolysis

Hydrolysis of nitriles



Important to consider the CN triple bond as similar to C=O double bond

Nitrile Hydrolysis with acid:



Nitrile Hydrolysis with base: