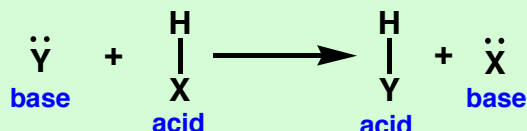


Substitution at the Carbonyl Carbon (Acyl Substitution)

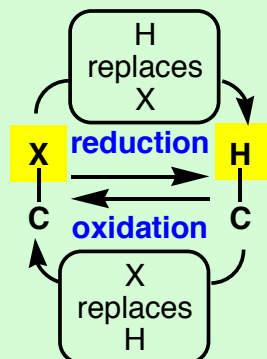
We previously studied **substitution** reactions at sp^3 carbon and concluded that they proceed either by the $[S_N1]$ or the $[S_N2]$ pathway. Here we examine substitution at the sp^2 carbonyl carbon (**nucleophilic acyl substitution reactions**). We'll see that substitution at sp^2 atoms generally proceed by pathways much different than those at sp^3 atoms.

1) Acid-Base - hydrogen swap

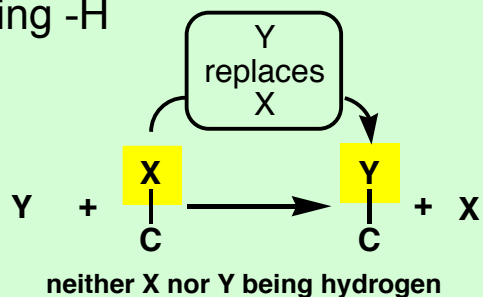


2 & 3) Oxidation & Reduction

change in the number of C-H bonds in relation to the number of C-X bonds

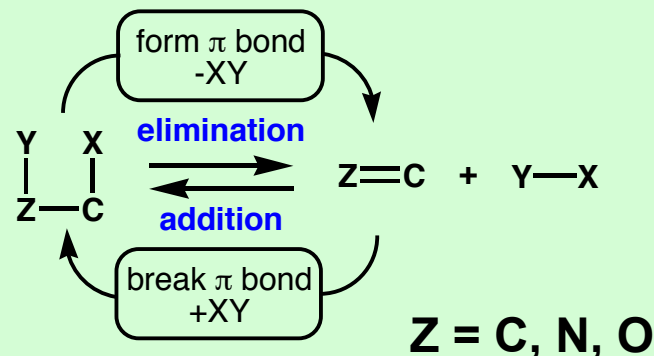


4) Substitution - replace C's substituent (-X) with another (-Y), neither being -H

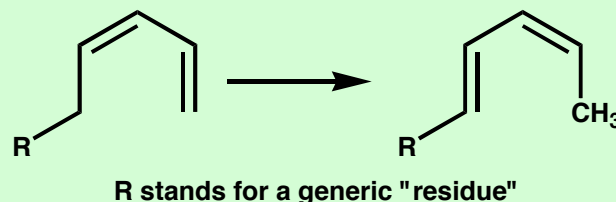


5) Elimination - loss of XY elements with concomitant pi bond formation

6) Addition - gain of XY elements with concomitant loss of pi bond



7) Rearrangement - isomerization process (no atoms lost or gained); results in new bonding connectivity (one of many examples shown as there is no generic representation).



Nucleophilic Acyl Substitution: Three Examples

