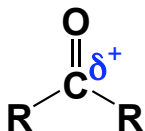


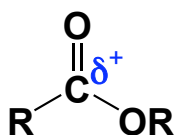
REAGENTS USED IN CARBON-CARBON BOND FORMATION

Carbon Electrophiles



ketones & aldehydes

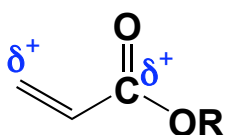
Nucleophilic addition reactions



esters, acids chlorides, etc.

leaving group attached to carbonyl carbon

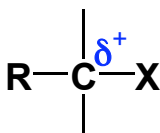
Acyl transfer reactions



α,β -unsat carbonyls, nitriles, etc.

1,2 - add'n/sub with **hard** nucleophiles

1,4 - addition with **soft** nucleophiles



alkyl halides, alkyl tosylates, etc.

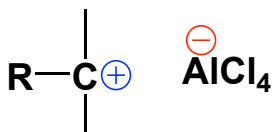
leaving group attached to an sp^3 carbon

Nucleophilic substitution reactions



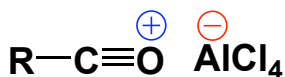
oxiranes

Nucleophilic addition reactions



carbocations

Fridel-Crafts alkylation



acylium ions

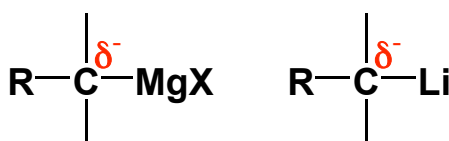
Fridel-Crafts acylation

Carbon Nucleophiles



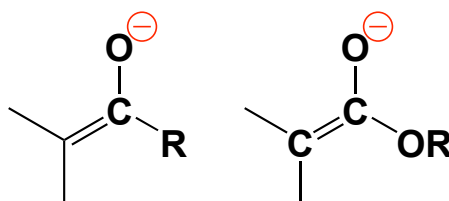
anions of terminal acetylenes

addition, substitution & acyl transfer



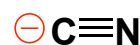
Grignard reagents and alkyl lithiums

addition & and acyl transfer



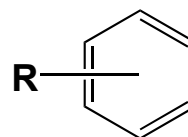
enolates

addition, substitution & acyl transfer



cyanide ion

cyanohydrin formation



substituted arenes

Fridel-Crafts alkylation/acylation