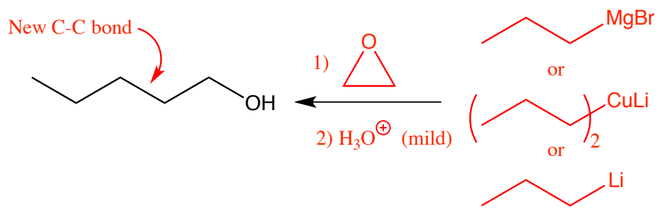
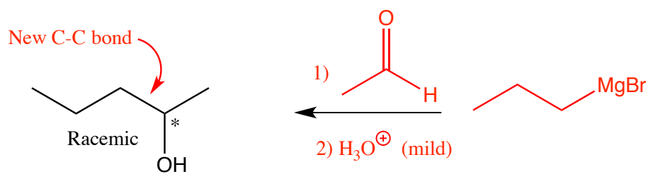
Iverson CH 320N KRE Table Part 1: For use in synthesis problems, count carbons in products and starting materials then identify location(s) of new bonds, especially C-C or C=C bonds. With that information, use the following KREs to determine which reactions are appropriate.

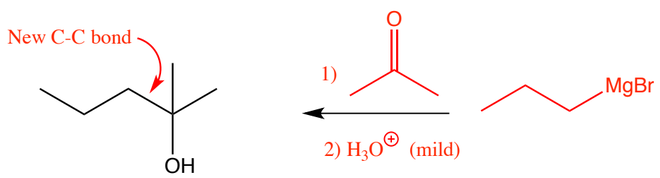
KRE: A new C-C bond two carbons away from an -OH group indicates an organometallic reacting with an epoxide.



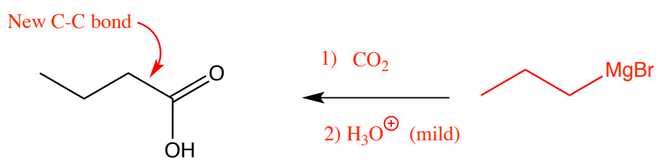
KRE: A new C-C bond on the same carbon as a secondary -OH group indicates a Grignard reacting with an aldehyde.



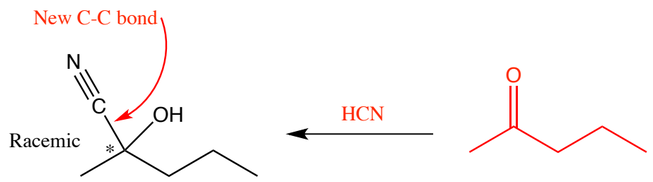
KRE: A new C-C bond on the same carbon as a tertiary -OH group indicates a Grignard reacting with a ketone.



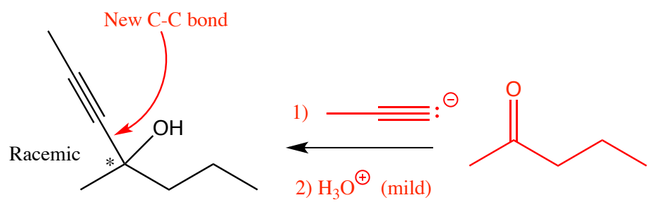
KRE: A new C-C bond on on a carboxylic acid in which one carbon atom was added indicates a Grignard reacting with CO_2.



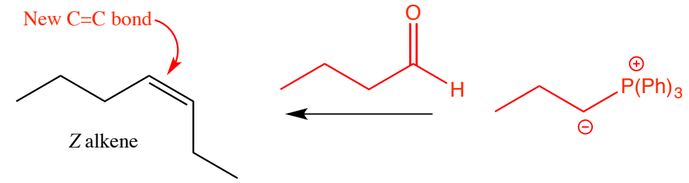
KRE: A new C-C bond from a CN on the same carbon as an -OH group indicates HCN reacting with a ketone or aldehyde.



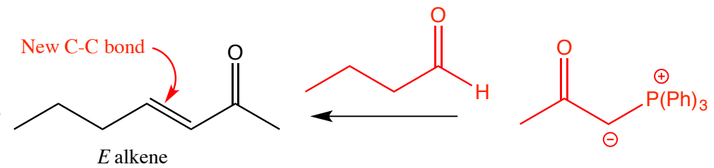
KRE: A new C-C bond from an alkyne on the same carbon as an -OH group indicates an alkyne anion reacting with a ketone or aldehyde.



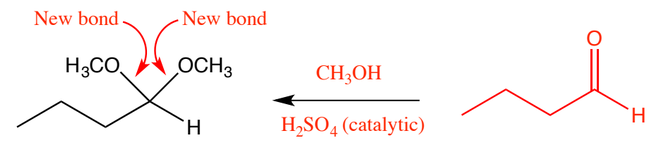
KRE: A new *Z* C=C bond indicates an alkyl Wittig reagent was used.



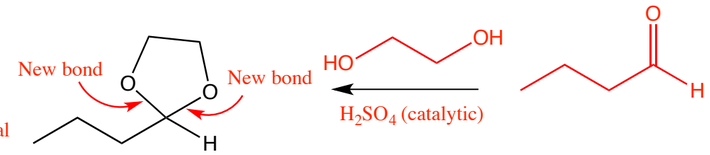
KRE: A new *E* C=C bond indicates a Wittig reagent with a carbonyl adjacent to the negative charge (enolate Wittig) was used.



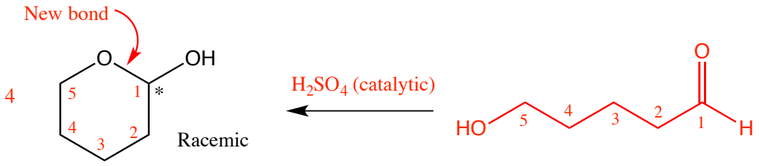
KRE: An acetal where a carbonyl used to be indicates acetal formation with an alcohol.



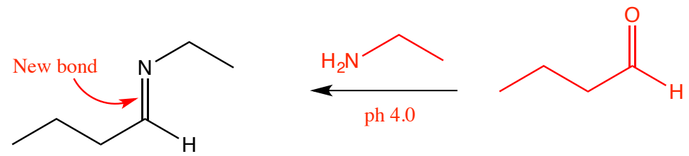
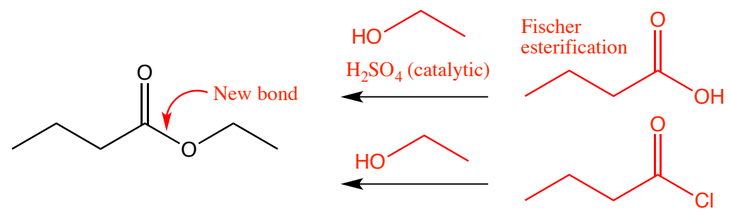
KRE: A five or six-membered ring cyclic acetal where a carbonyl used to be indicates acetal formation with a two or three carbon diol.



KRE: A five or six-membered ring cyclic hemiacetal indicates 4 or 5-carbon hydroxyaldehyde starting material.



KRE: An imine indicates an aldehyde or ketone reacting with a primary amine or ammonia



KRE: Ester group