Iverson CH 320N KRE Table 2: 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: This is a lactone (cyclic ester). The six-membered ring indicates a 5-carbon hydroxy acid starting material that undergoes Fischer esterification.

KRE: An amide group indicates a base.

KRE: A ketone with an new C-C adjacent to the carbonyl indicates an acid chloride reacting with a Gilman reagent.

KRE: A ketone with an α,β-unsaturated aldehyde that indicates an aldol reaction followed by dehydration. In this case the ring is formed because a 6-carbon dialdehyde is used.

KRE: This is a cyclic β-ketoester that indicates a Dieckmann reaction starting with a 6-carbon diester. Notice that Dieckmann reactions require 1.0 equivalent of base.

KRE: This is a nucleophile linked to the β-carbon of the amide. This is also a methyl ketone. Putting these together indicates a Michael reaction starting with acetoester.

KRE: Reaction of a nucleophile (β-diketone) connected to the β-carbon of a carboxyl (the ester)

KRE: This is a α,β-unsaturated aldehyde with an E,Z mixture indicates an aldol reaction followed by dehydration in acid.