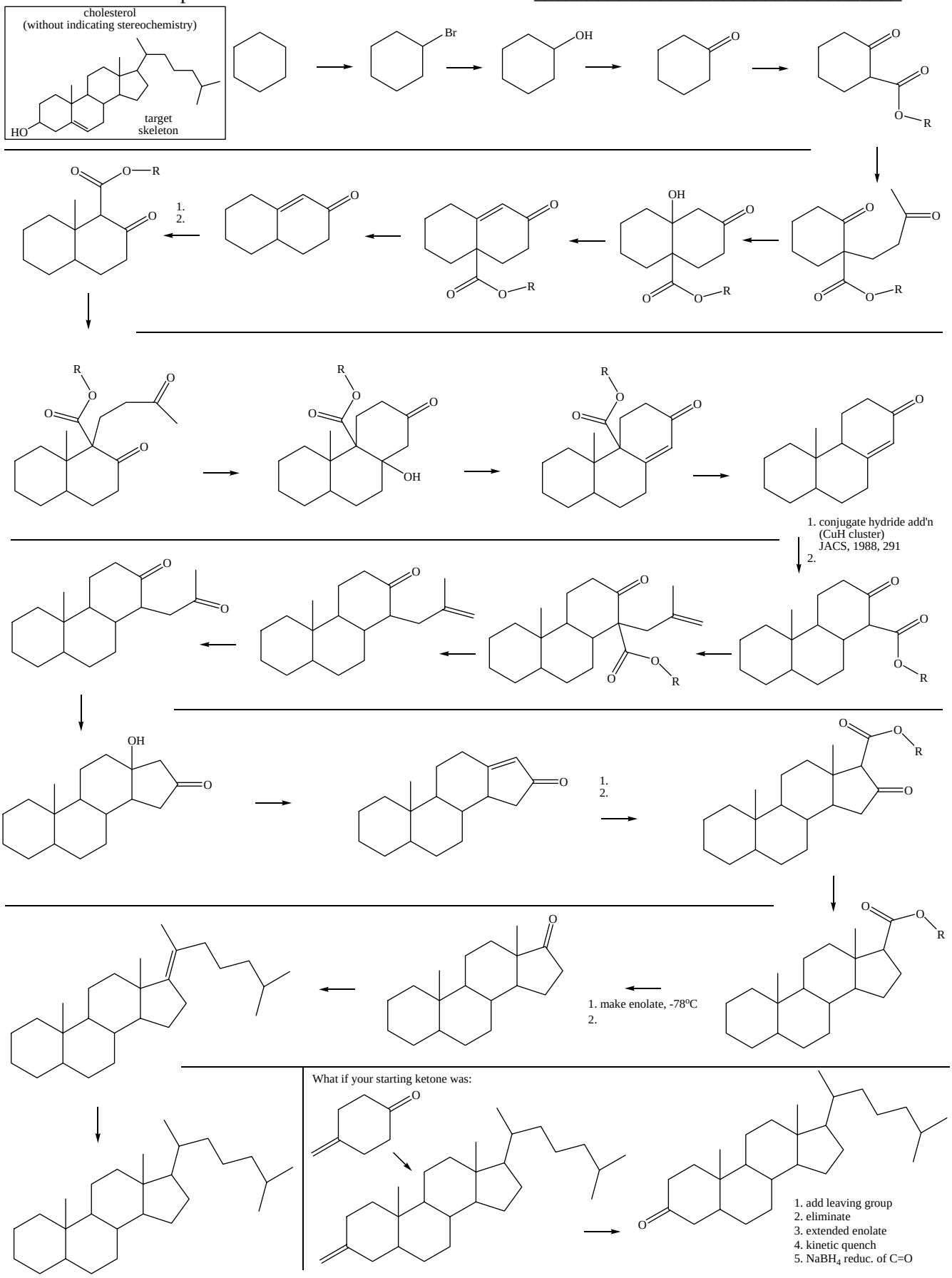
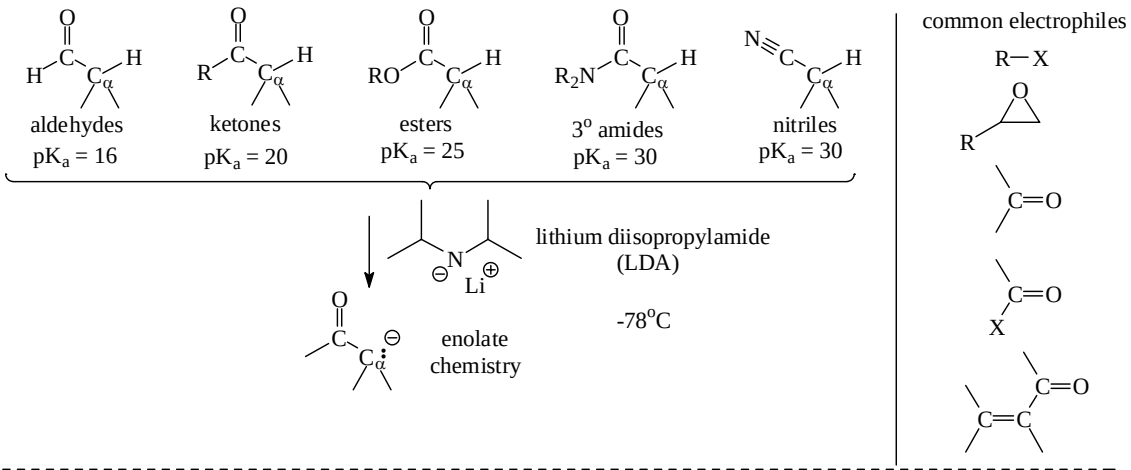
Chem 316/Beauchamp Name _____

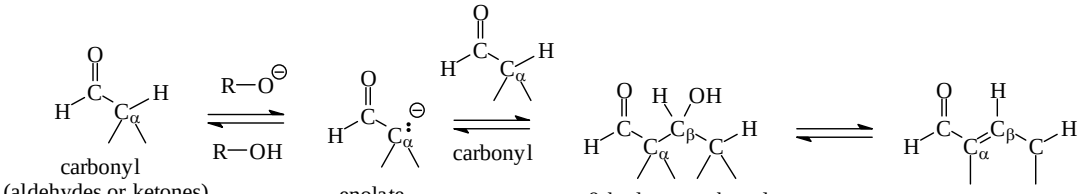


1. Making enolates with very strong base, such as LDA, at low temperature, enolates form irreversibly and do not react until the electrophile is added and the temperature rises. This minimizes self reactions and other side reactions.

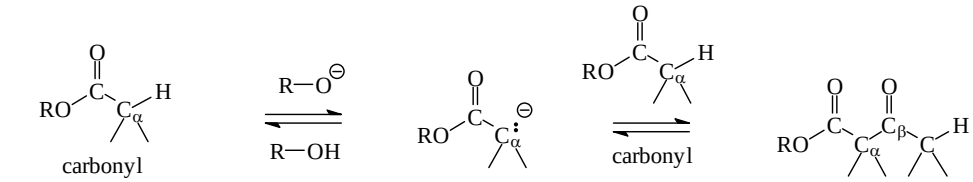


2. Making enolates with moderate bases, equilibrium mixture of enolate and carbonyl compound

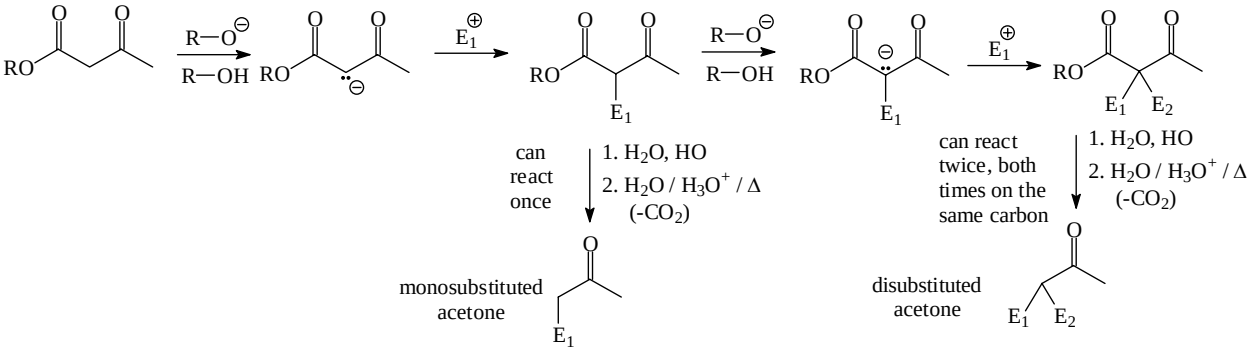
a. aldol reactions (aldehydes or ketones, single carbonyl stabilized enolates)



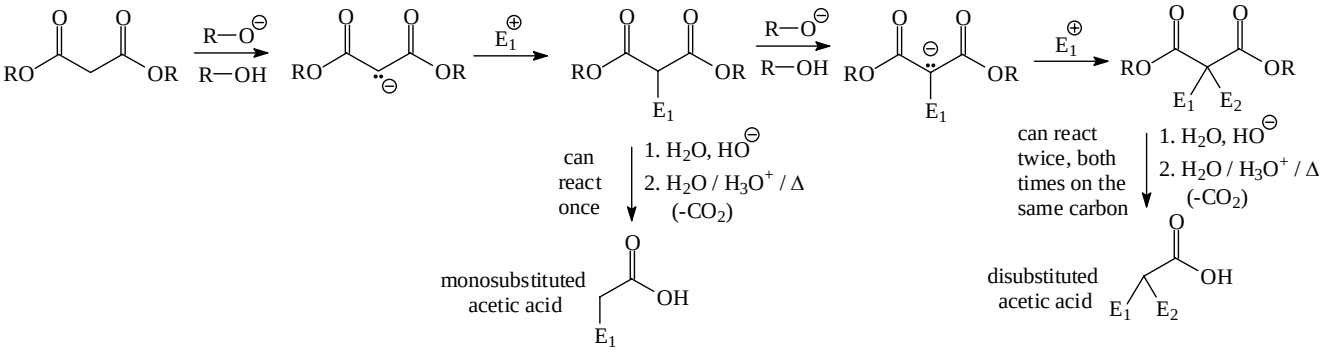
b. Claisen reactions (esters, single carbonyl stabilized enolates)



c. acetoacetic ester syntheses – distabilized enolates, substituted acetone derivatives (2-propanones), react once or twice on the same, more stable carbanion position

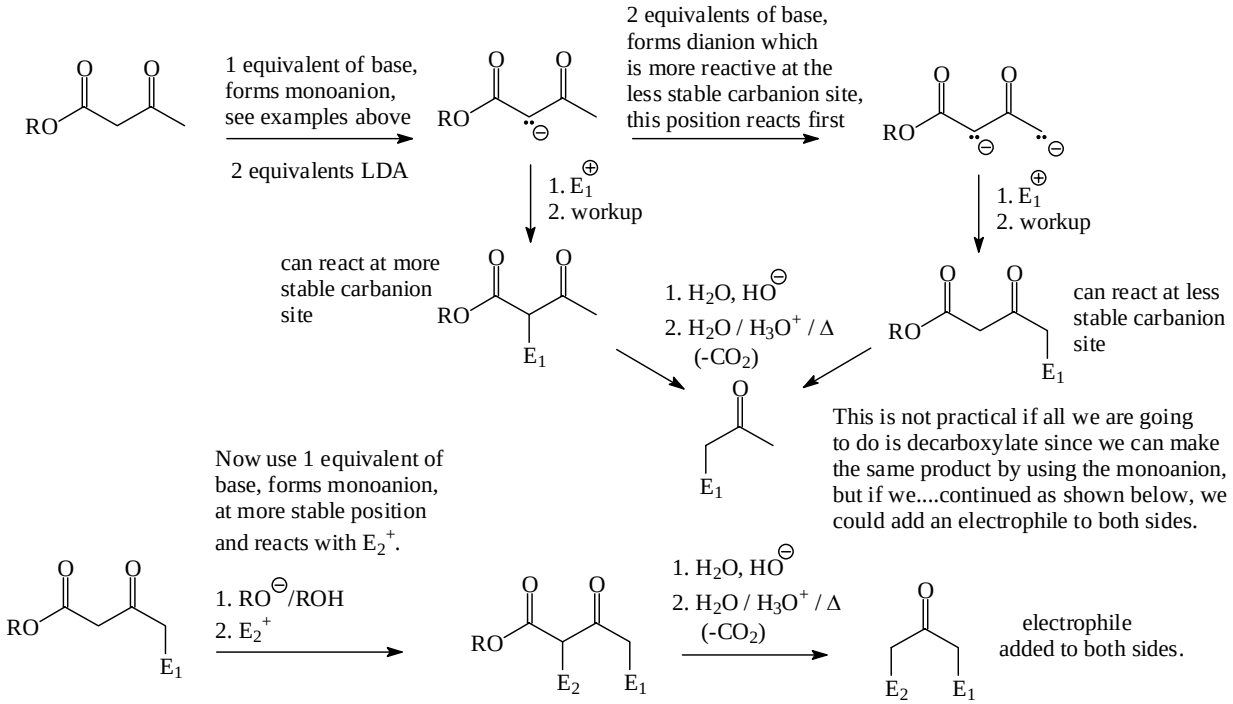


d. malonic ester syntheses – destabilized enolates, substituted acetic acid derivatives (ethanoic acids), react once or twice on the same, more stable carbanion position

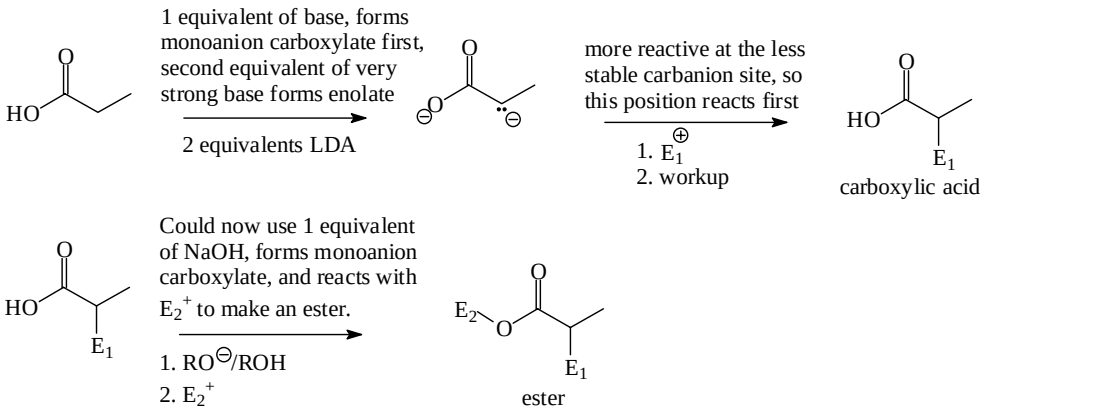


3. Dianions

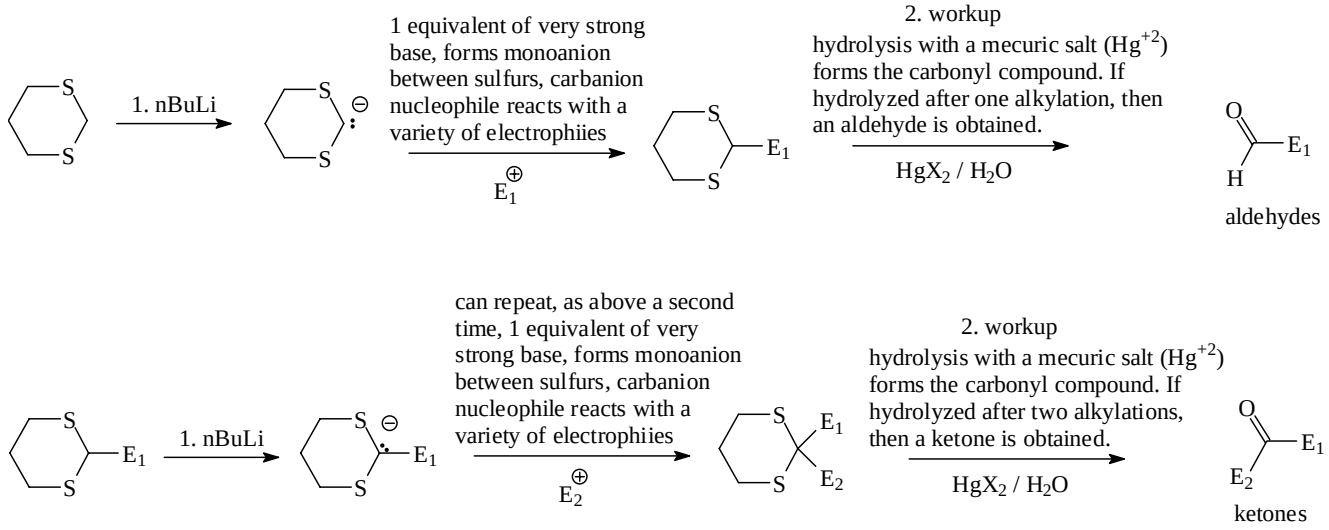
a. dianions of ethyl acetoacetate – can alkylate at more reactive position and less reactive position



b. dianions of carboxylic acids – can alkylate at more reactive position and less reactive position



4. Dithiane – run reaction sequence once to get aldehydes and twice to get ketones



Propose a synthesis for the following molecules using the starting material indicated. Write down each step of your syntheses, showing the necessary reagents and products formed for each step. Do not write mechanisms.