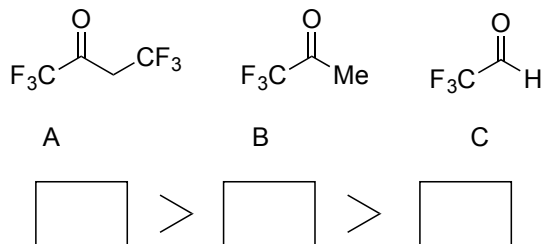
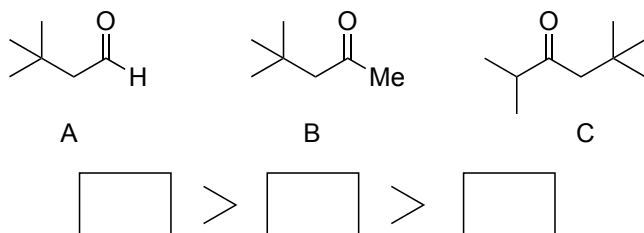


Worksheet 3, Chem 51C, Jarvo

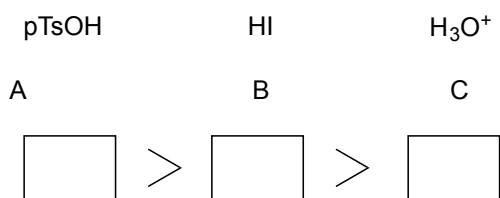
1. a. Rank the following compounds from highest to lowest percent hydrate:



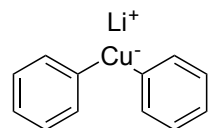
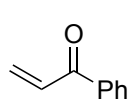
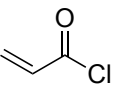
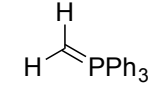
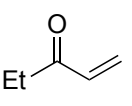
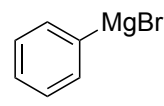
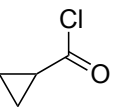
b. Rank the following compounds from fastest to slowest addition of HCN:



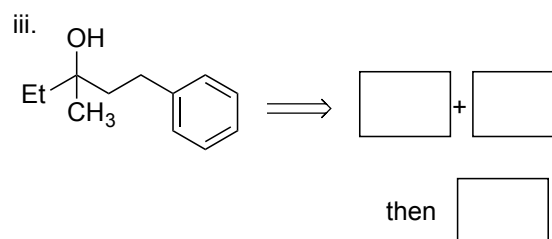
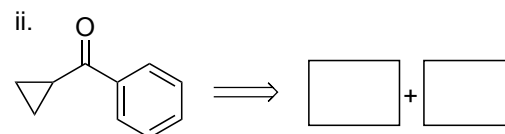
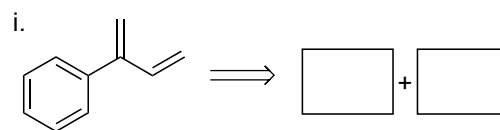
c. Rank the following from most to least acidic, and list the pKa's:



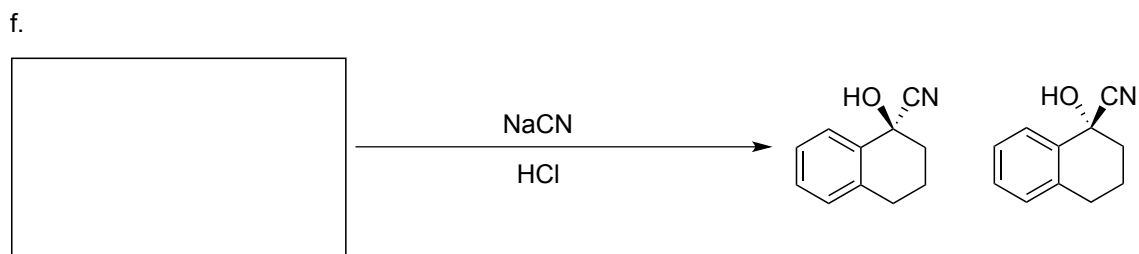
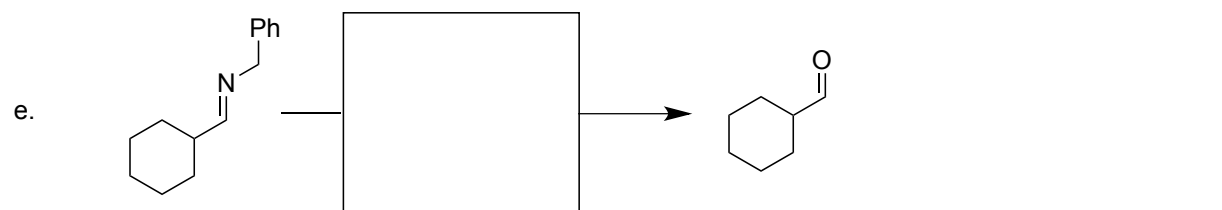
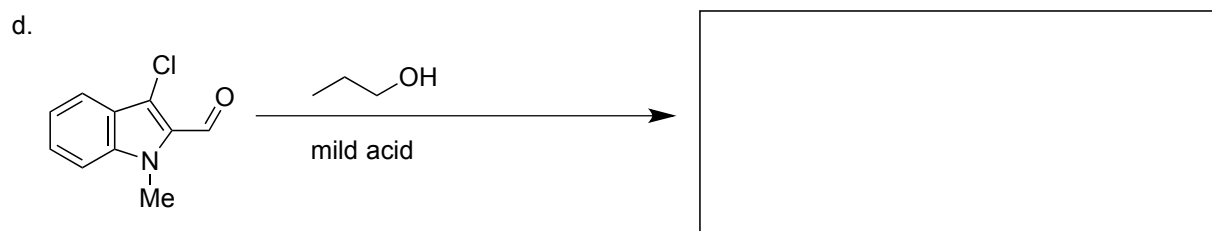
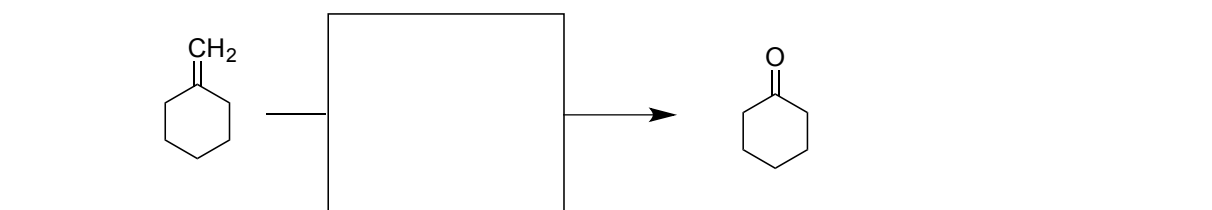
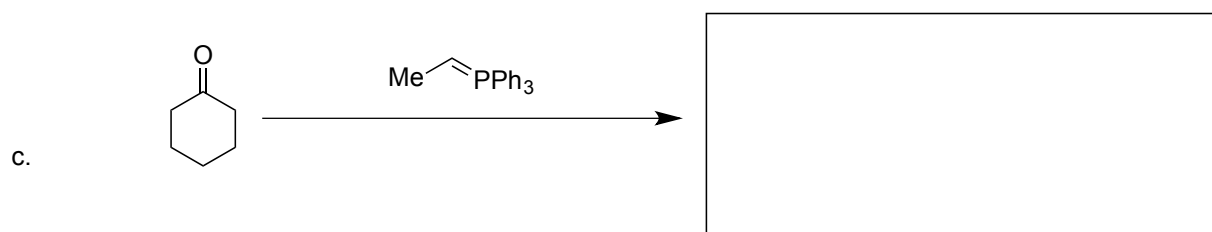
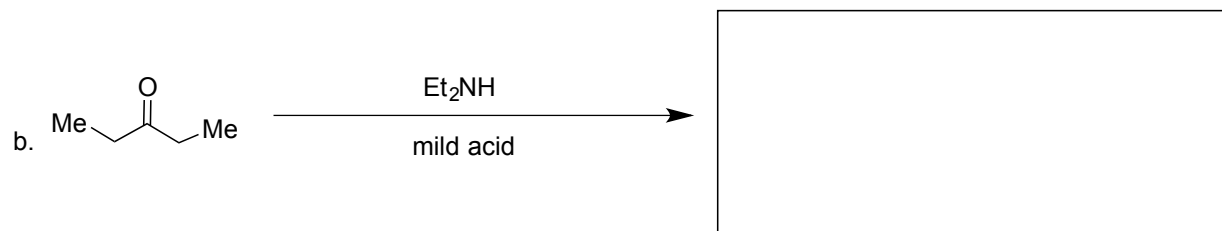
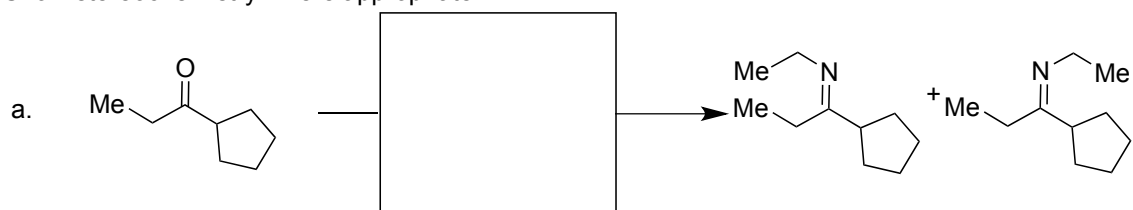
d. Fill in the correct nucleophile and electrophile from the table to complete the retrosyntheses.

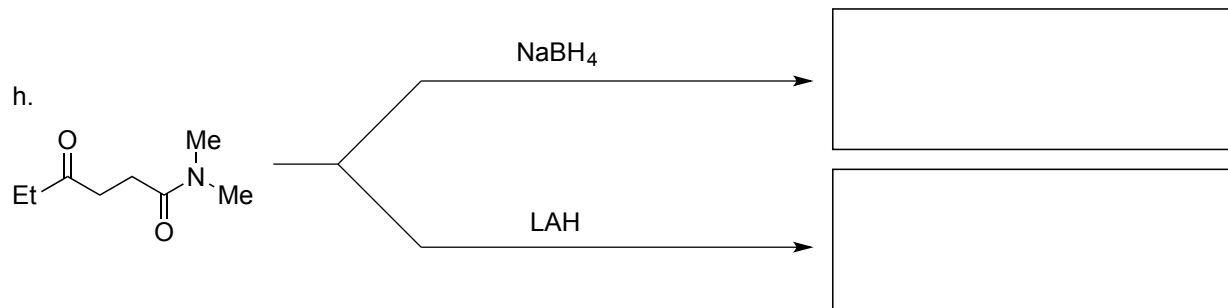
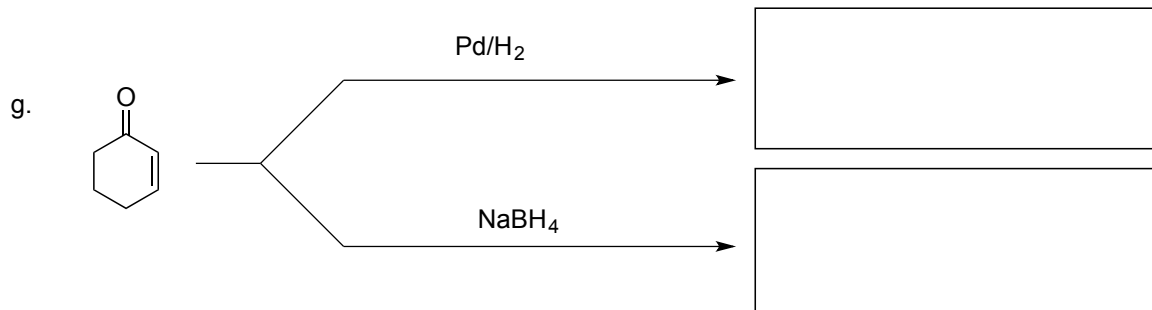
| Nucleophiles  | Electrophiles   |
|---|---|
| A  | E  |
| B $\text{H}_3\text{C}-\text{MgBr}$  | F  |
| C  | G  |
| D  | H  |

Products

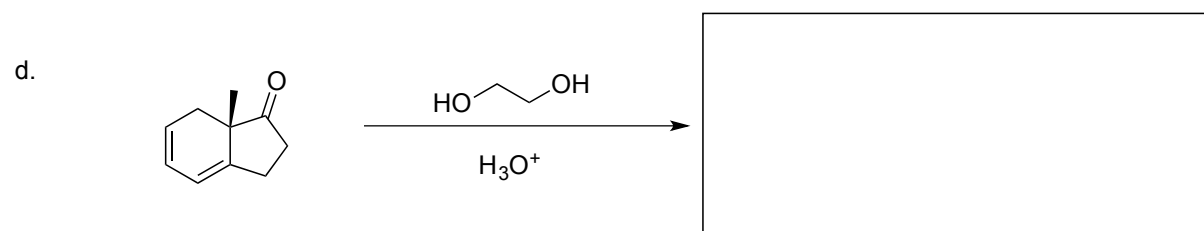
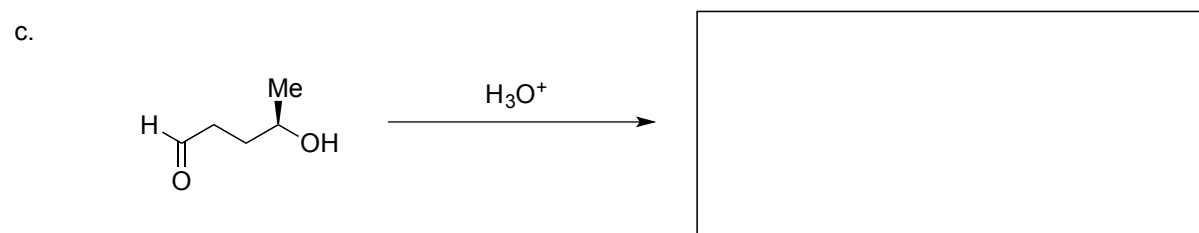
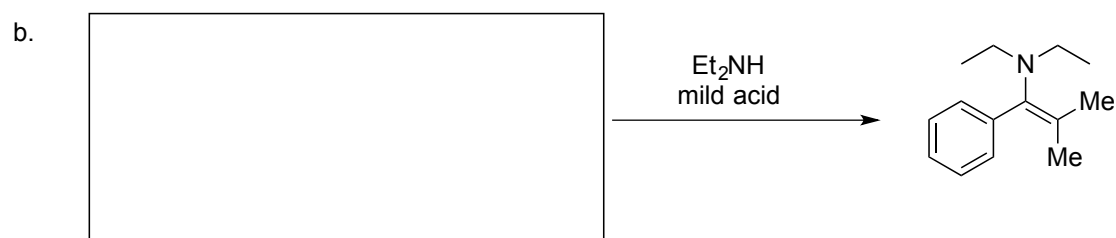
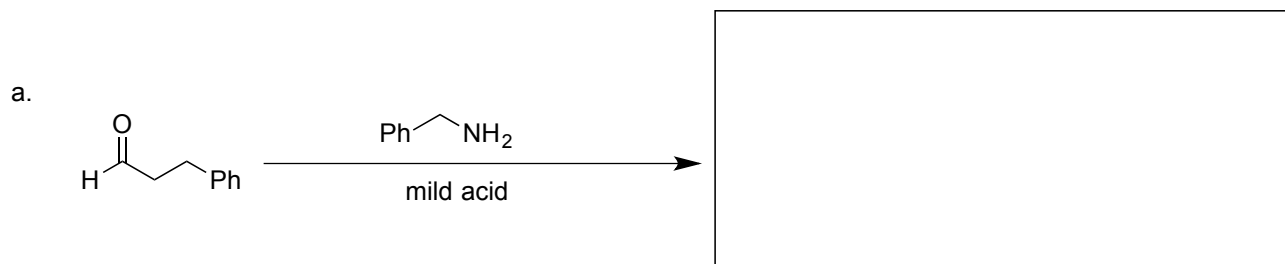


2. Fill in the boxes with the appropriate starting material, reagent or major product.  
 Show stereochemistry where appropriate



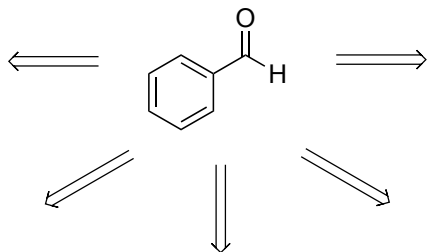


3. Fill in the blank and provide an arrow-pushing mechanism.

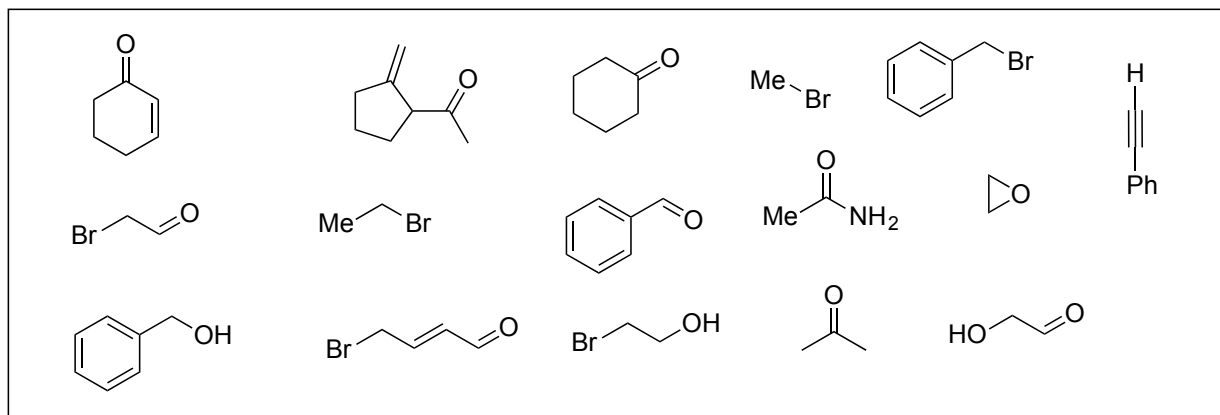


4. a. List all the carbon-centered nucleophiles that you know (hint: there are 6). For each one, draw an example reaction where the nucleophile is used to make a new C–C bond.

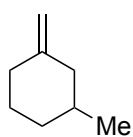
b. Show five different methods for synthesis of benzaldehyde, each one from a different starting material and using different reagents.



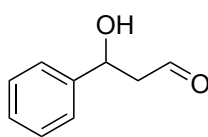
5. Propose syntheses of the targets shown below. You can use any of the possible starting materials and any reagent you wish. All the carbon must come from the starting materials provided.



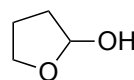
**Target A.**



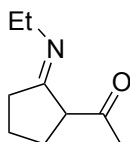
**Target B.**



**Target C.**



**Target D.**



**Target E.**

