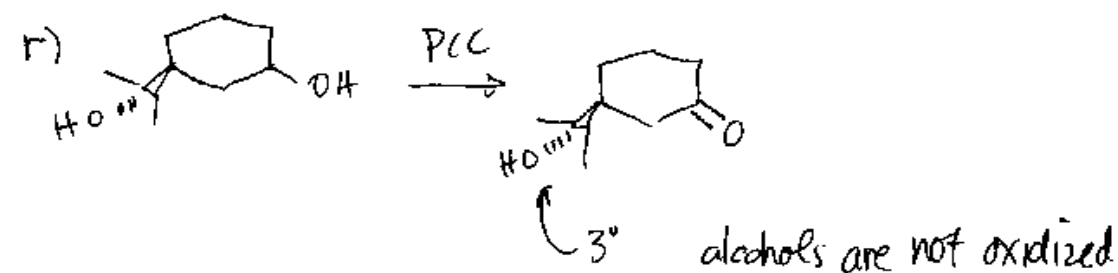
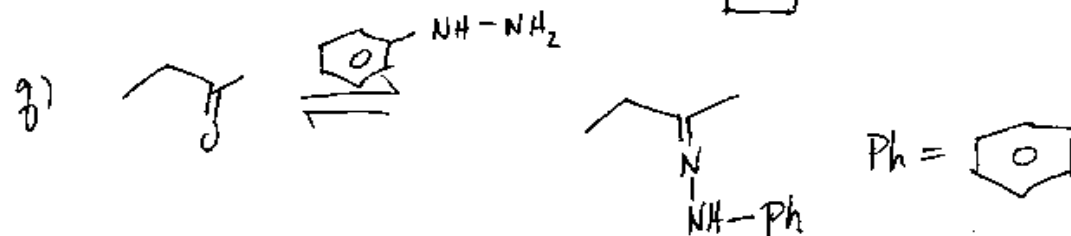
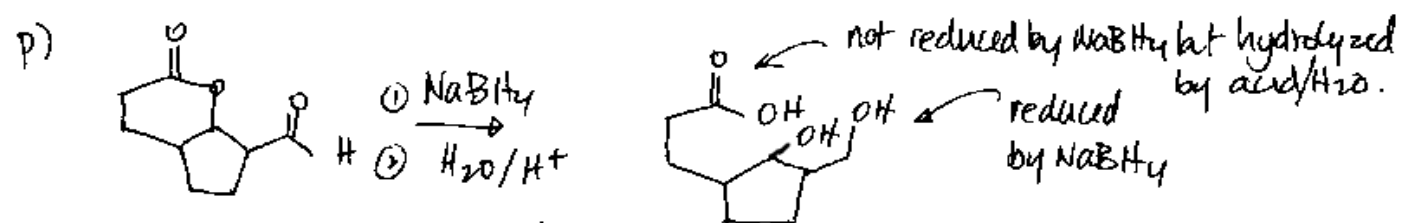
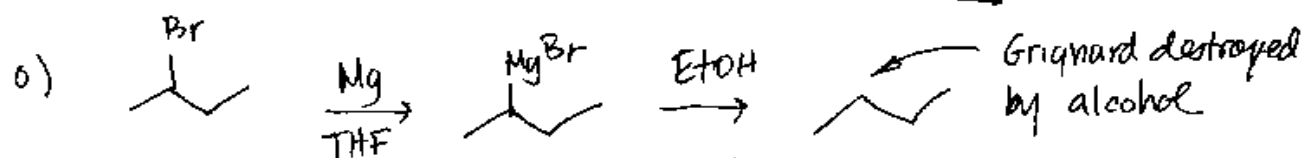
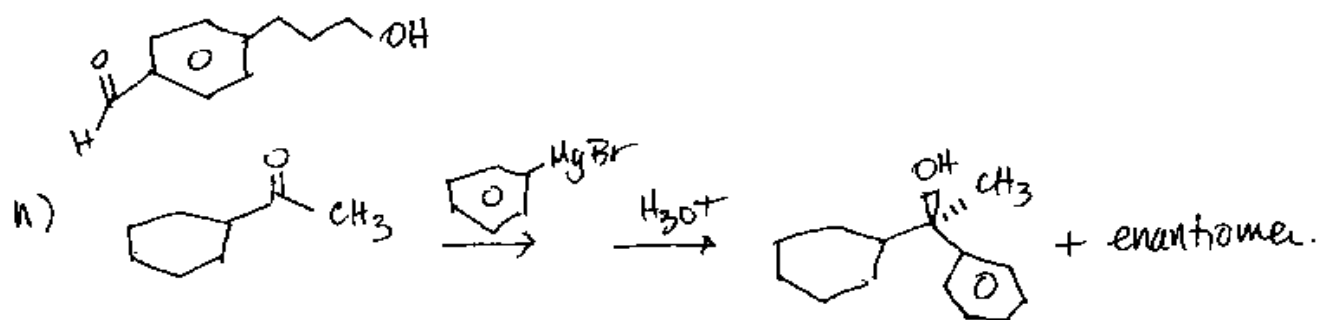
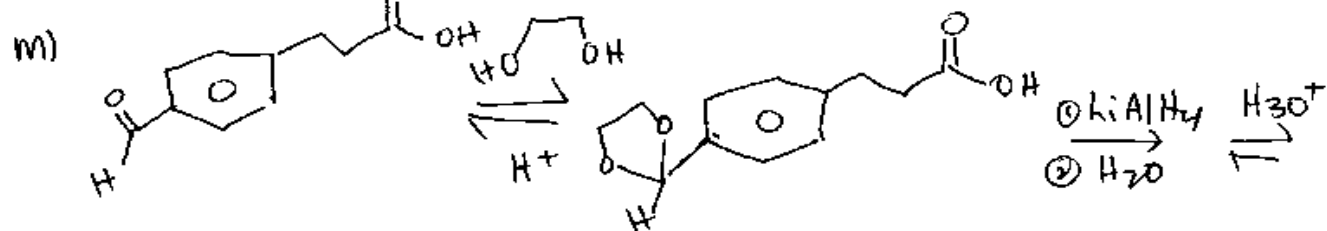
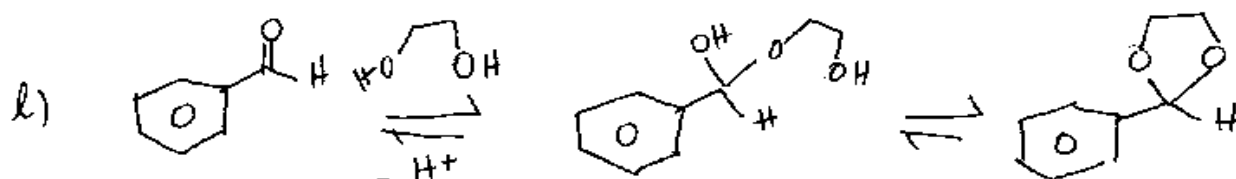
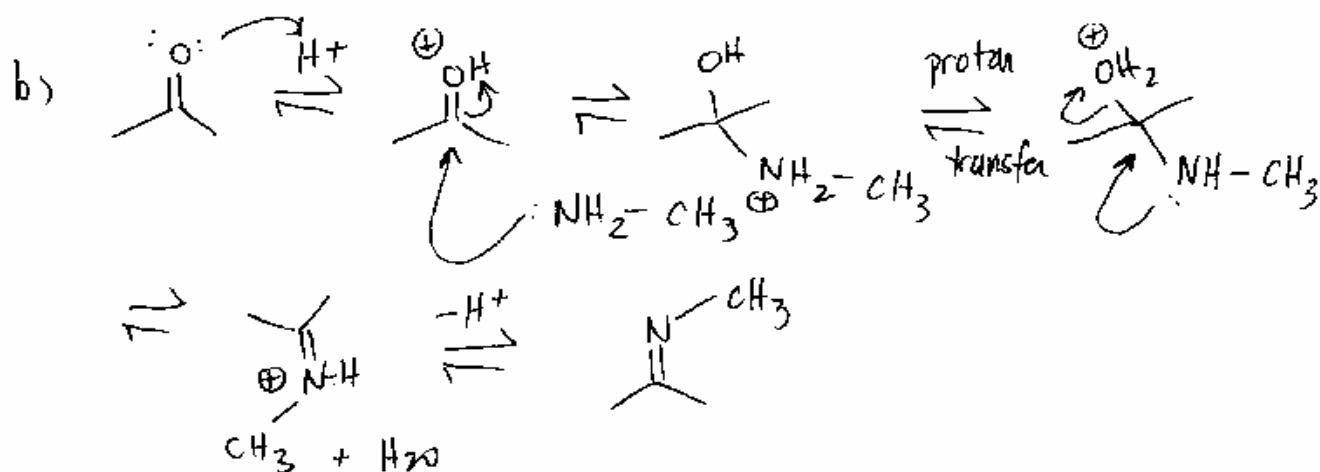
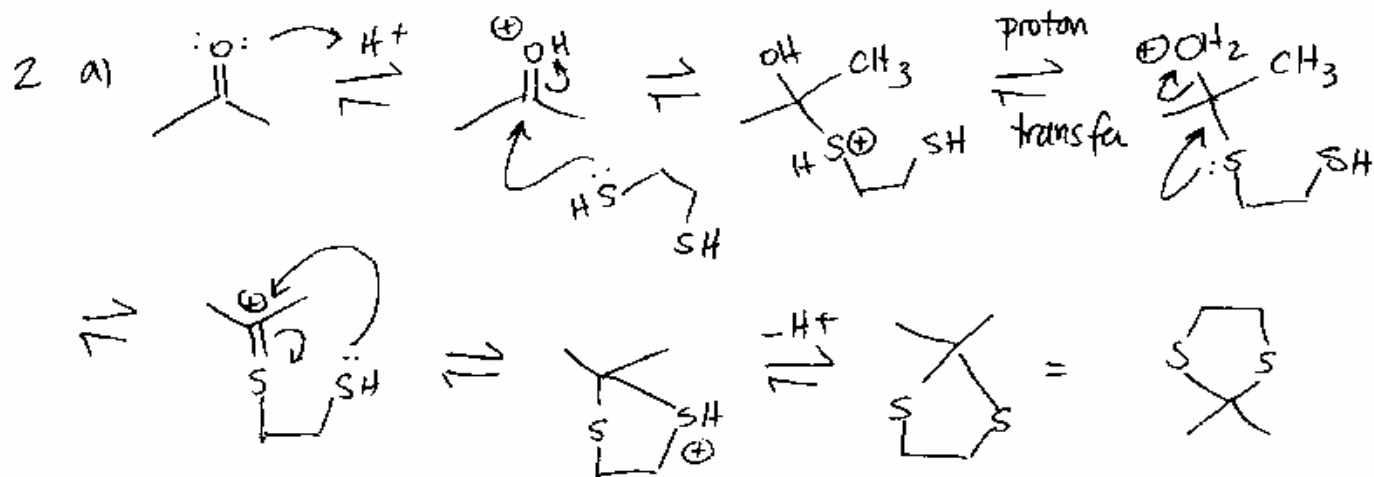
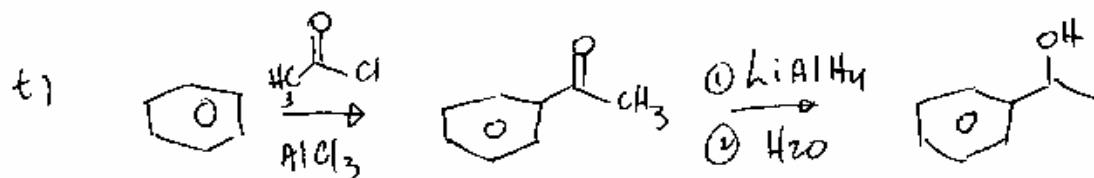
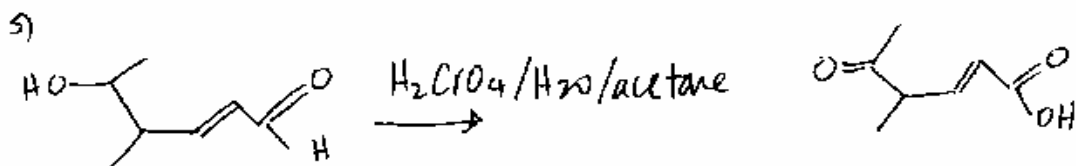
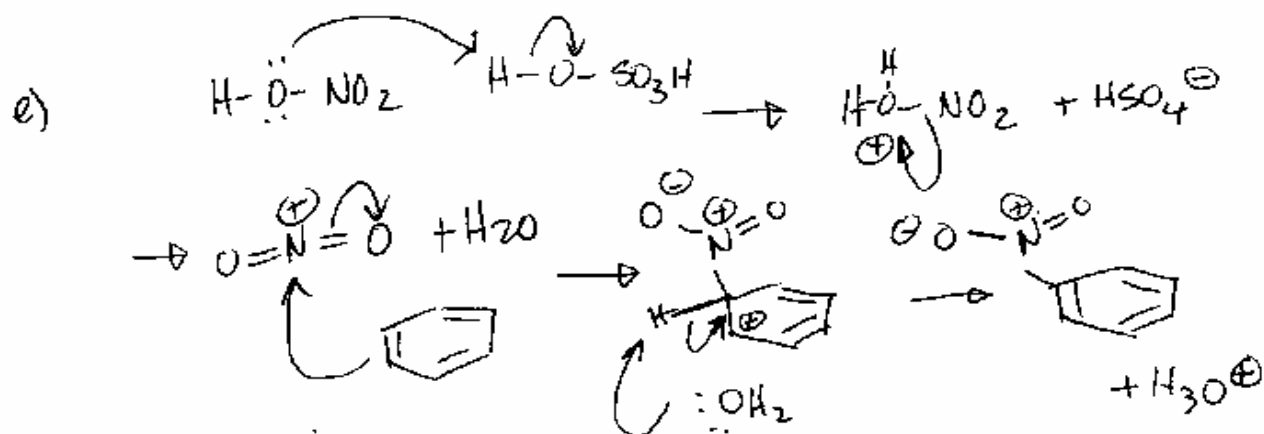
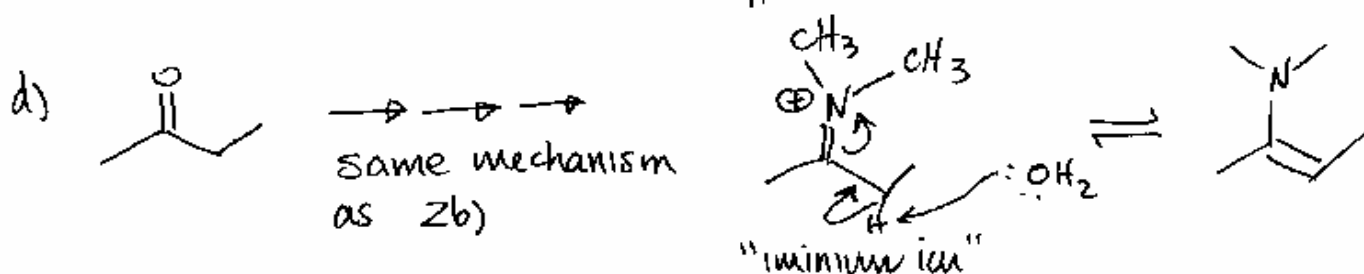
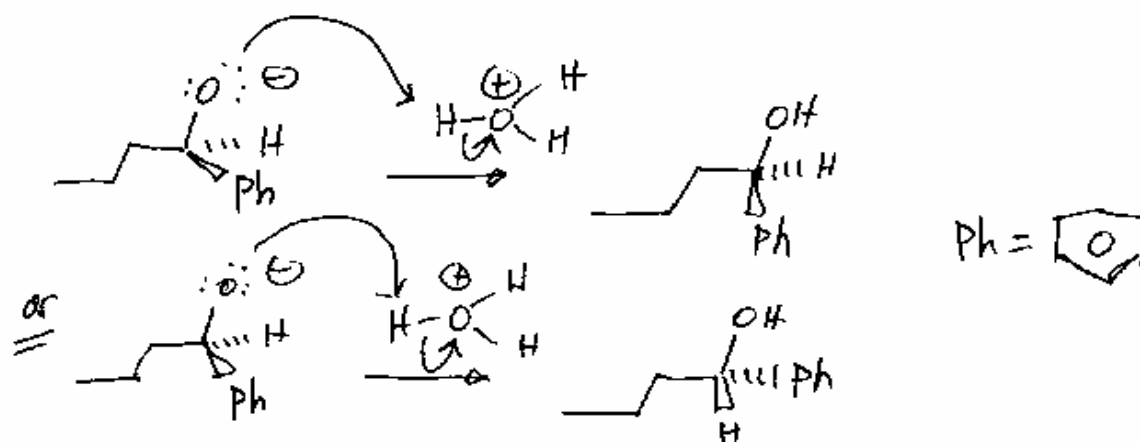
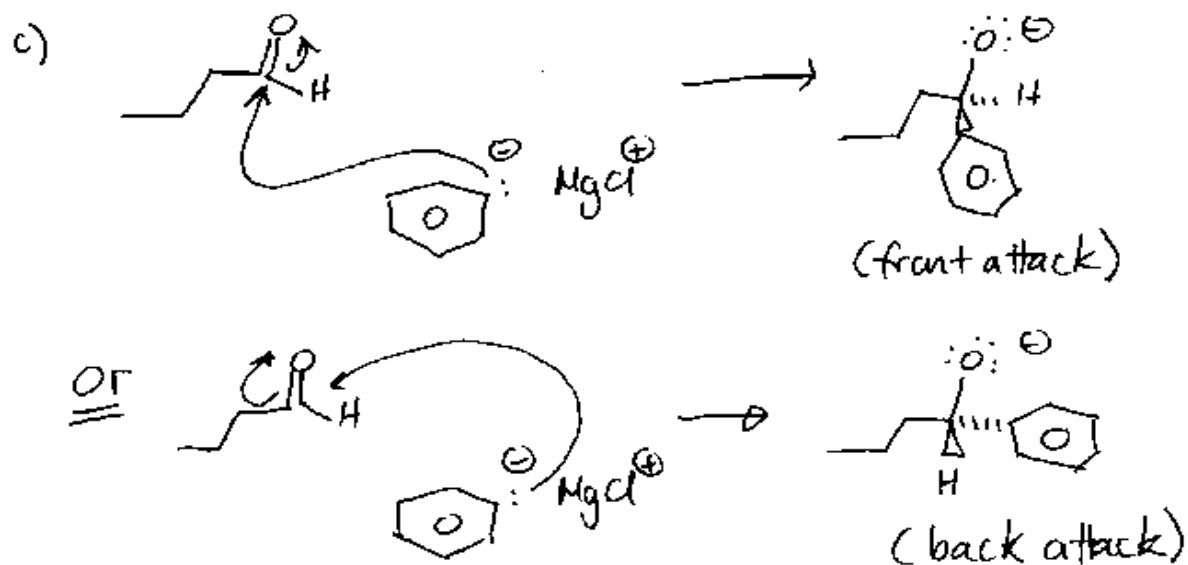


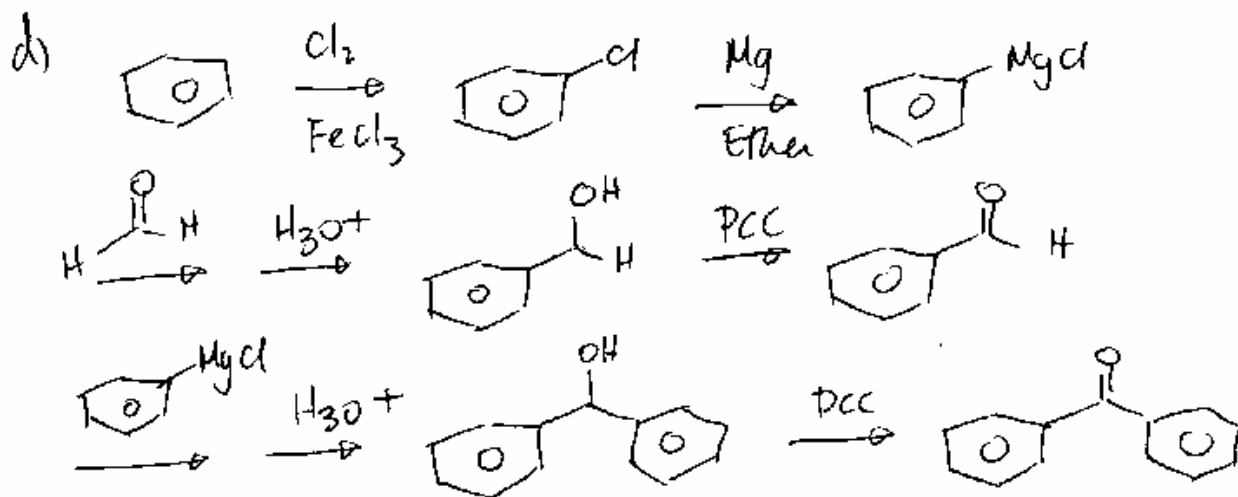
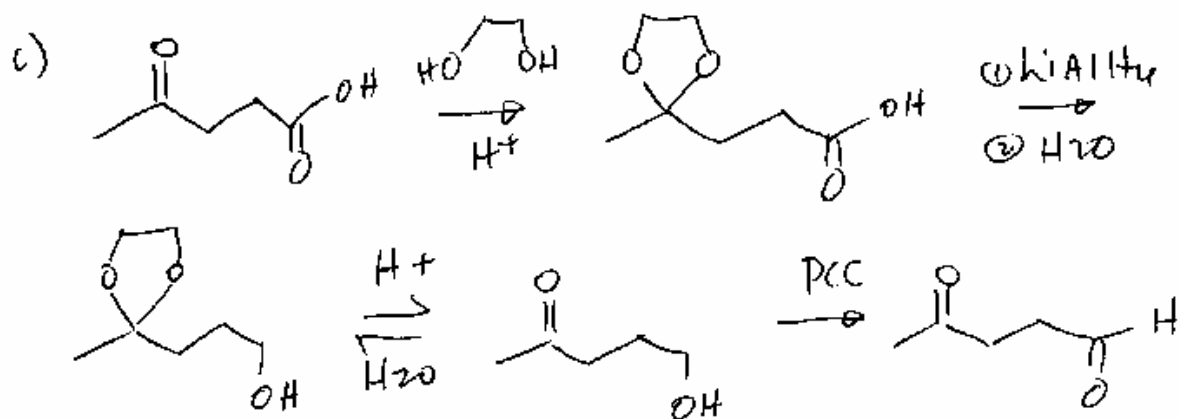
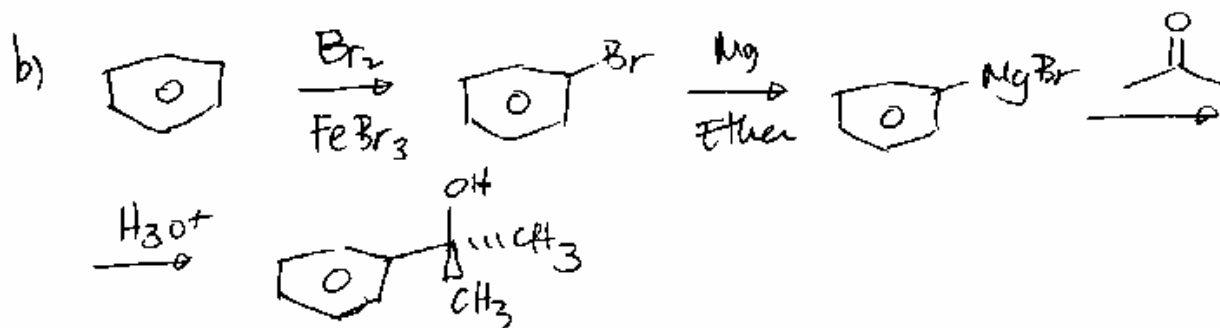
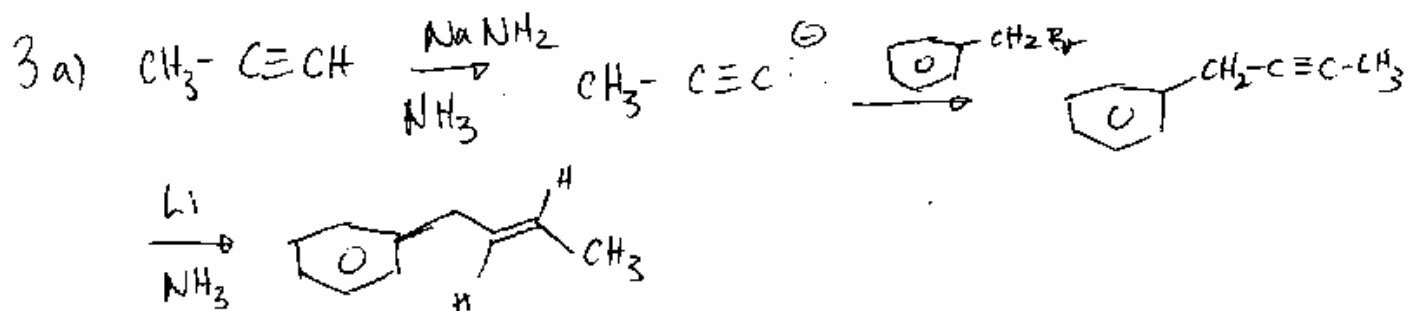
- 1 a) $\text{CH}_3-\text{C}\equiv\text{C}-\text{CH}_3 \xrightarrow[\text{Lindlar}]{\text{H}_2} \text{CH}_3-\text{C}(\text{H})=\text{C}(\text{H})-\text{CH}_3$
- b) $\text{CH}_3-\text{C}\equiv\text{C}-\text{CH}_3 \xrightarrow[\text{HgSO}_4]{\text{H}_2\text{O}, \text{H}_2\text{SO}_4} \text{CH}_3-\text{C}(\text{OH})=\text{CH}-\text{CH}_3 \rightleftharpoons \text{CH}_3-\text{CH}_2-\text{C}(=\text{O})-\text{CH}_3$
 (note that a catalyst is required for the hydration of alkynes.)
- c) $\text{CH}_3-\text{C}\equiv\text{C}-\text{H} \xrightarrow{\text{NaNH}_2} \text{CH}_3-\text{C}\equiv\text{C}:^-$
- d) $\text{CH}_3-\text{C}\equiv\text{C}-\text{CH}_3 \xrightarrow[\text{NH}_3]{\text{Li}} \text{CH}_3-\text{C}(\text{H})=\text{C}(\text{H})-\text{CH}_3$
- e) $\text{Cyclopropyl}-\text{C}\equiv\text{C}-\text{H} \xrightarrow[\text{HCl}]{\text{excess}} \text{Cyclopropyl}-\text{CCl}_2-\text{CH}_3$
- f) $\text{CH}_3-\text{CH}_2-\text{C}\equiv\text{C}-\text{H} \xrightarrow[\text{1 equiv.}]{\text{Br}_2} \text{CH}_3-\text{CH}_2-\text{C}(\text{Br})=\text{C}(\text{Br})-\text{H}$
- g) $\text{CH}_3-\text{C}(=\text{O})-\text{CH}_3 \xrightleftharpoons[\text{H}^+]{\text{H}_2\text{O}} \text{CH}_3-\text{C}(\text{OH})_2-\text{CH}_3$
- h) $\text{CH}_3-\text{C}(=\text{O})-\text{CH}_3 \xrightleftharpoons[\text{H}^+]{\text{CH}_3\text{CH}_2\text{OH}} \text{CH}_3-\text{C}(\text{OH})(\text{OCH}_2\text{CH}_3)_2$
- i) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{C}(=\text{O})\text{H} \xrightleftharpoons{\text{NH}_2\text{CH}_3} \text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{C}(\text{H})=\text{N}-\text{CH}_3 + \text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{C}(\text{H})=\text{N}-\text{CH}_3$
- j) $\text{Cyclohexanone} \xrightleftharpoons[\text{HCl}]{\text{NaCN}} \text{Cyclohexyl}-\text{C}(\text{OH})(\text{CN})-\text{H} + \text{enantiomer}$
- k) $\text{Bicyclo[2.2.1]hept-5-en-2-one} \xrightarrow[\text{2) H}_2\text{O}]{\text{1) LiAlH}_4} \text{Bicyclo[2.2.1]hept-5-en-2-ol} + \text{Bicyclo[2.2.1]hept-5-en-2-ol}$

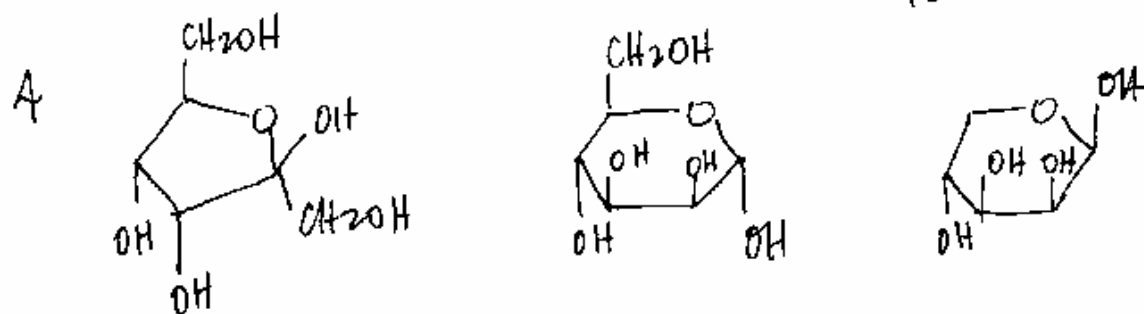
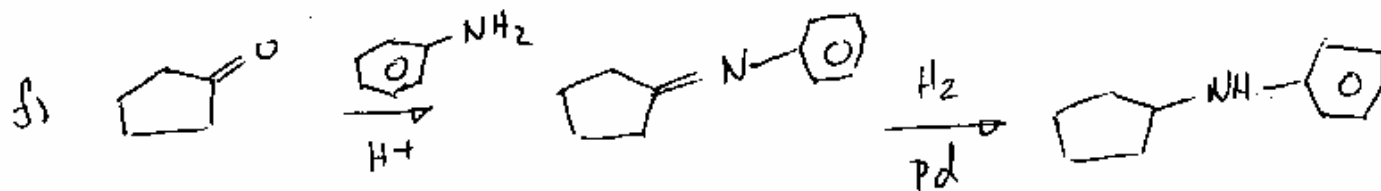
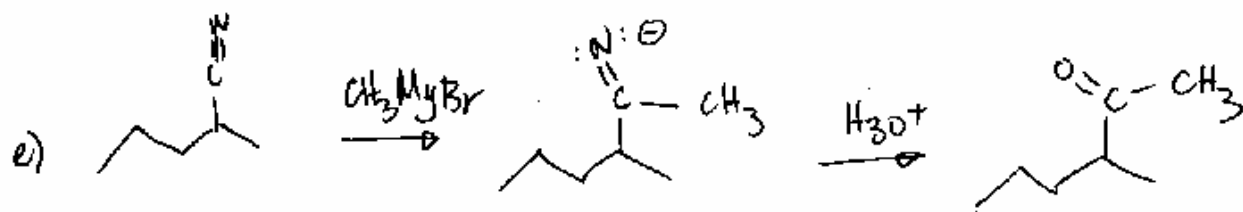




NOTE: BE SURE THAT YOU UNDERSTAND WHAT EXACTLY IS MEANT MECHANISTICALLY BY "PROTON TRANSFER" and "-H+" !







5 a) D b) D c) D d) L e) L f) D

