


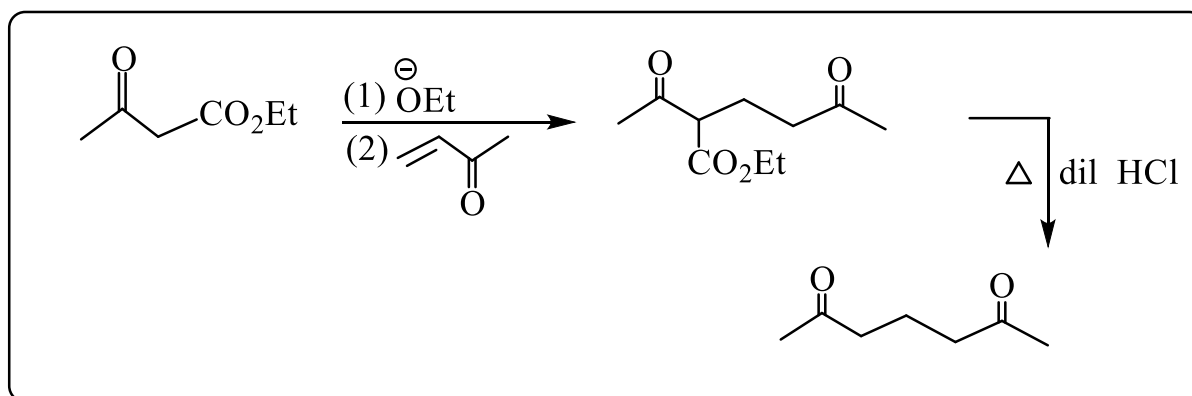
جدول يوضح الانفصالات والسنثونات لبعض المركبات العضوية

| Compound   | $\xrightarrow{\text{dis.}}$ | Nucleophilic  | + | Electrophilic   |
|--|-----------------------------|---|---|---|
| Compound   |                             | Nucleophilic  |   | Electrophilic   |
| $R - R_1$  |                             | $R^\ominus$<br>RMgX , RLi , .....   |   | $R_1^\oplus$<br>( R — X )<br>RCl , RBr , ROSO <sub>2</sub> R  |
| RCH <sub>2</sub> CH <sub>2</sub> OH  |                             | $R^\ominus$<br>RMgX , RLi , .....   |   | $\text{CH}_2\text{CH}_2\text{OH}^\oplus$<br> |
| $\begin{array}{c} R \\   \\ R - C - OH \\   \\ R \end{array}$  |                             | $R^\ominus$<br>RMgX , RLi , .....   |   | $\begin{array}{c} R - C^\oplus - OH \\   \\ R \\ \text{RCOR} \end{array}$   |
| RCO <sub>2</sub> H   |                             | $R^\ominus$<br>RMgX , RLi , .....   |   | $\text{CO}_2\text{H}^\oplus$<br>CO <sub>2</sub> H   |
| $\begin{array}{c} O \\    \\ R - C - R \end{array}$  |                             | $R^\ominus$<br>RMgX , RLi , .....   |   | $\text{RC}=\text{O}^\oplus$<br>RCOX ( X = Cl, Br, ... ) ,<br>( RCO ) <sub>2</sub> O , RCO <sub>2</sub> R                        |
| $R - C \equiv C - R_1$   |                             | $\begin{array}{c} R - C \equiv C^\ominus \\ \text{RC} \equiv \text{C}^\oplus \text{Na}^\oplus , R - C \equiv \text{C Li} \\ R - C \equiv \text{C MgX} \end{array}$  |   | $R_1^\oplus$<br>R — X   |
| $\begin{array}{c} O \\    \\ R - C \equiv C - C - R \end{array}$                                     |                             | //  |   | $\text{RC}=\text{O}^\oplus$<br>RCOX ( X = Cl, Br, ... ) ,<br>( RCO ) <sub>2</sub> O , RCO <sub>2</sub> R                        |
| RCH ( CO <sub>2</sub> R <sub>1</sub> ) <sub>2</sub>  |                             | $\text{CH}^\ominus ( \text{CO}_2\text{R}_1 )_2$<br>CH <sub>2</sub> ( CO <sub>2</sub> R <sub>1</sub> ) <sub>2</sub>  |   | $R^\oplus$<br>( R — X )<br>RCl , RBr , ROSO <sub>2</sub> R  |
| $\begin{array}{c} \text{CO}_2\text{R} \\ / \\ R - \text{CH} \\ \backslash \\ \text{COR} \end{array}$ |                             | $\begin{array}{c} \text{CO}_2\text{R} \\ / \\ \text{CH}^\ominus \\ \backslash \\ \text{COR} \end{array} / \begin{array}{c} \text{CO}_2\text{R} \\ / \\ \text{CH}_2 \\ \backslash \\ \text{COR} \end{array}$ |   | //  |

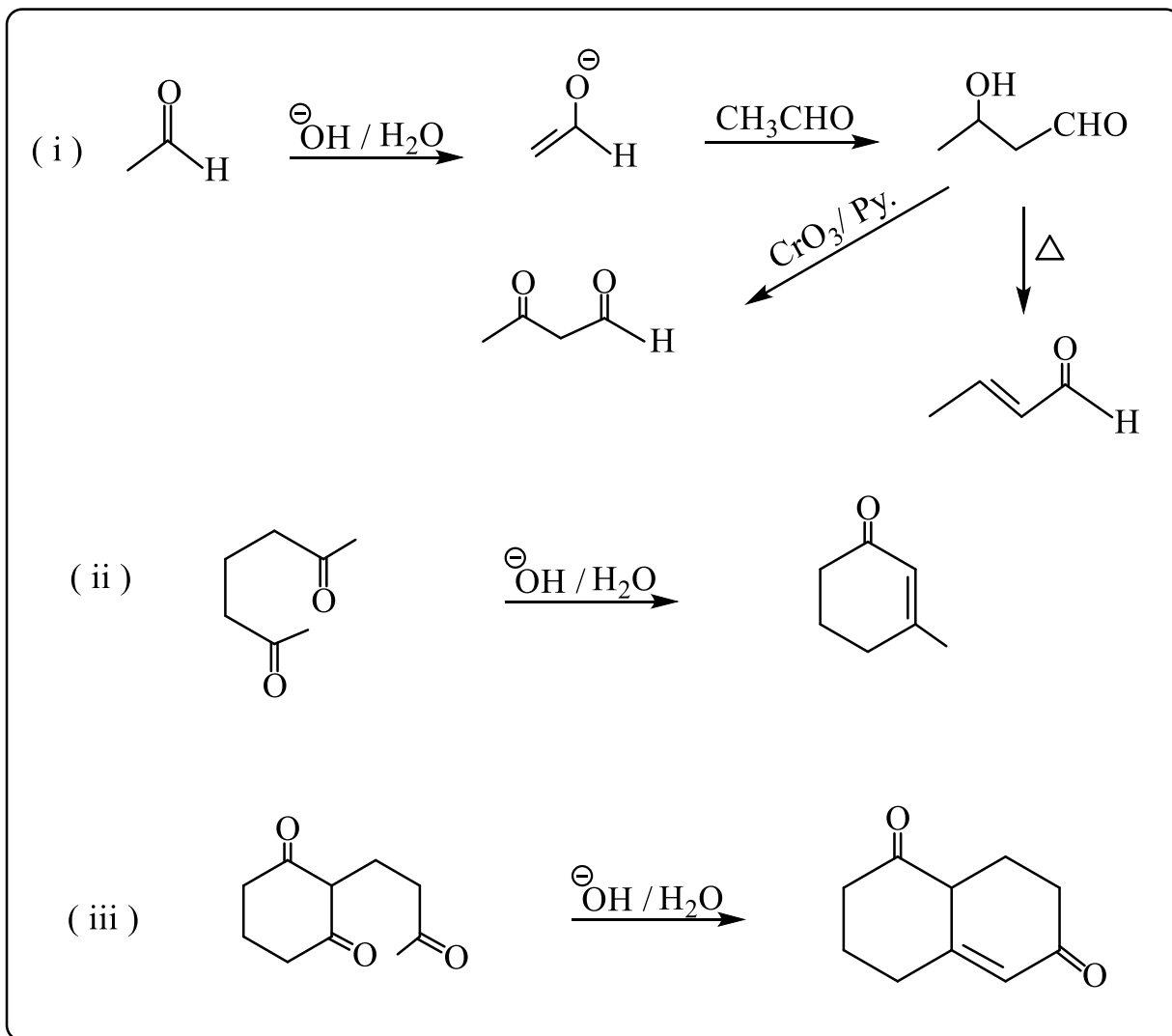
| Compound   | $\xrightarrow{\text{dis.}}$ | Nucleophilic  | + | Electrophilic   |
|--|-----------------------------|---|---|---|
| Compound   |                             | Nucleophilic  |   | Electrophilic   |
| $\text{RCH}_2\text{COCH}_2\text{COR}$  |                             | $\ominus\text{CH}_2\text{COCH}_2\text{COR}$<br>$\text{CH}_3\text{COCH}_2\text{COR}$   |   | $\text{R}^\oplus$<br>( $\text{R}-\text{X}$ )<br>$\text{RCl}$ , $\text{RBr}$ , $\text{ROSO}_2\text{R}$   |
| $\text{RCO} \begin{array}{c} \diagup \text{COR} \\ \text{CH} \\ \diagdown \text{COR} \end{array}$                              |                             | $\ominus \begin{array}{c} \diagup \text{COR} \\ \text{CH} \\ \diagdown \text{COR} \end{array} / \begin{array}{c} \diagup \text{COR} \\ \text{CH}_2 \\ \diagdown \text{COR} \end{array}$ |   | $\text{RC}^\oplus=\text{O}$<br>$\text{RCOX}$ ( $\text{X} = \text{Cl}, \text{Br}, \dots$ ) ,<br>( $\text{RCO}$ ) $_2\text{O}$ , $\text{RCO}_2\text{R}$   |
| $\text{R}_2\text{C} \begin{array}{c} \diagup \text{COR} \\ - \text{CH} - \text{R} \\   \\ \text{CH}(\text{COR})_2 \end{array}$ |                             | $\ominus \text{CH}(\text{COR})_2$<br>$\text{CH}_2(\text{COR})_2$  |   | $\text{R}-\text{C}^\oplus \begin{array}{c} \diagup \text{COR} \\ - \text{CH} - \text{R} \end{array}$<br>$\text{R}_2\text{C}=\text{C} \begin{array}{c} \diagup \text{COR} \\ - \text{R} \end{array}$ |
| $\text{RCOCHRCO}_2\text{R}$  |                             | $\ominus \text{RCHCO}_2\text{R}$<br>$\text{RCH}_2\text{CO}_2\text{R}$   |   | $\text{RC}^\oplus=\text{O}$<br>$\text{RCOX}$ ( $\text{X} = \text{Cl}, \text{Br}, \dots$ ) ,<br>( $\text{RCO}$ ) $_2\text{O}$ , $\text{RCO}_2\text{R}$   |
|  |                             |   |   |   |
|  |                             |   |   |   |
|  |                             |   |   |   |
|  |                             |   |   |   |
|  |                             |   |   |   |
|  |                             |   |   |   |

أمثلة على تفاعلات تكوين ( C – C ) :-

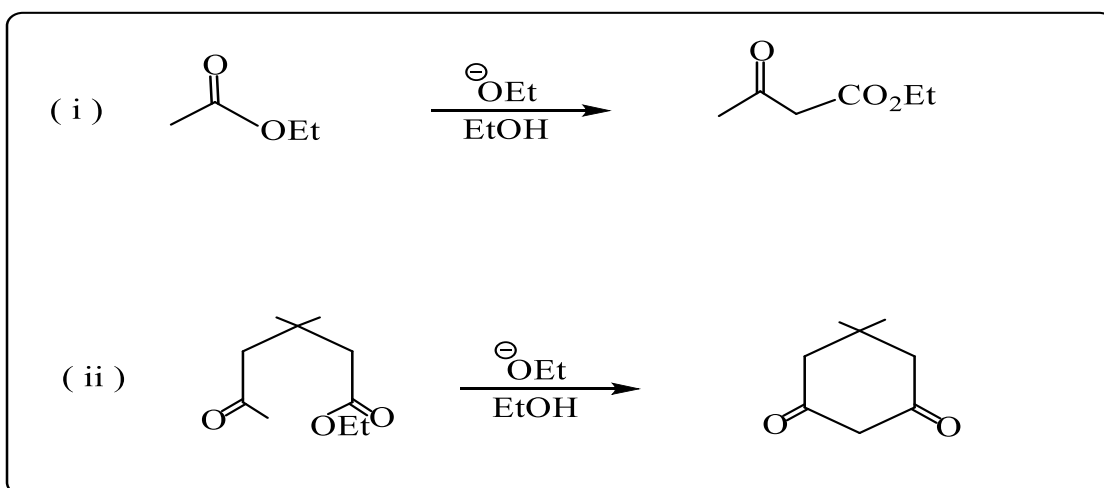
1 – Michael condensation ( C – C bond and 1,5 – dicarbonyl compound )



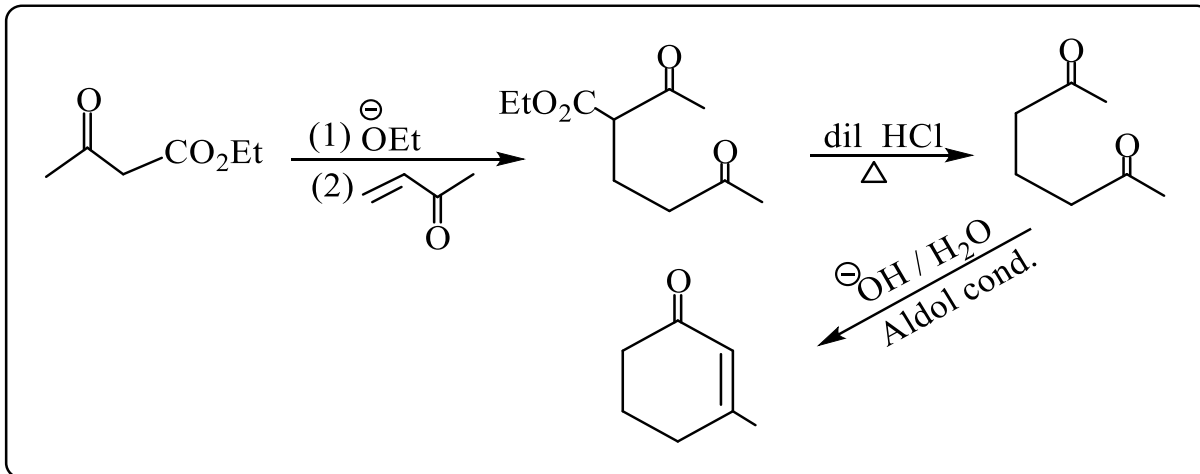
2 – Aldol condensation ( C – C bond and  $\alpha$  ,  $\beta$  unsaturated carbonyl )



### 3 – Claisen ester condensation ( C – C bond and 1,3 – dioxygen system )



### 4 - Michael followed by Aldol condensation ( C – C bond and for cyclisation )



5 - Michael followed by Claisen ester condensation ( C – C bond and cyclisation )

