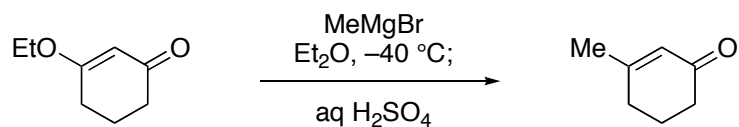


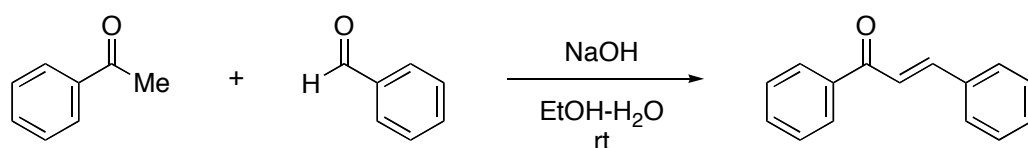
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以下の反応の反応機構を電子の流れがわかるように、別紙に矢印を使って記せ。

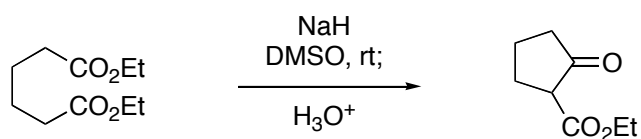
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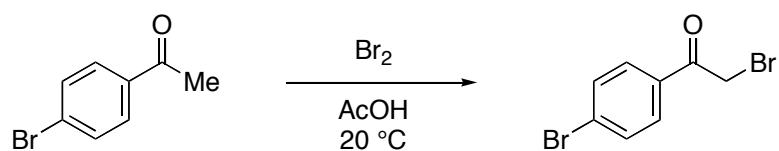
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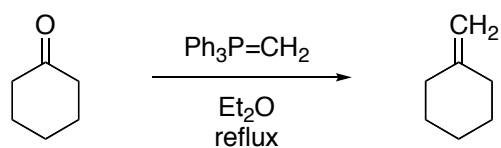
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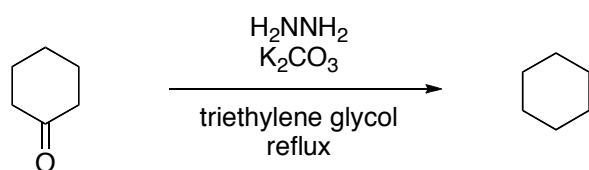
10.



11.



12.



7.

ヒント : A: 1,2-Addition of MeMgBr to the carbonyl group. B: Protonation followed by elimination of water helped by the oxygen lone pair of the ethoxy group. C: Addition of water. D: Proton transfer followed by elimination of EtOH.

8.

ヒント : Aldol reaction. A: Deprotonation of the ketone to form an enolate. B: Attack of the enolate to an aldehyde. C: Protonation and deprotonation followed by elimination of a hydroxy ion.

9.

ヒント : Dieckmann condensation. A: Deprotonation of the ester to form an enolate. B: Intramolecular addition of the enolate to the other ester. C: Elimination of ethoxide ion. D:  $\text{p}K_{\text{a}} \text{RCOCH}_2\text{CO}_2\text{R} = 10.7, \text{EtOH} = 16.$

10.

ヒント : A: Acid-catalyzed formation of an enol. B: Bromination of the electron-rich enol.

1 1.

ヒント: Wittig reaction. A: Addition of the ylide to the carbonyl group to form a betaine. B: Attack of the alkoxide to the phosphonium cation to form an oxaphosphetane. C: Irreversible elimination of  $\text{Ph}_3\text{P}=\text{O}$ .

1 2.

ヒント: Wolff-Kishner reduction. A: Addition of  $\text{H}_2\text{NNH}_2$  to the carbonyl group. B: Proton transfer followed by elimination of hydroxide ion to form a hydrazone. C: Deprotonation of the hydrazone. D: Elimination of  $\text{N}_2$ , an extremely good leaving group.