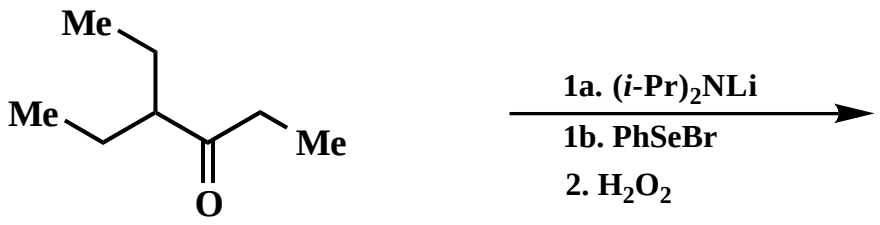
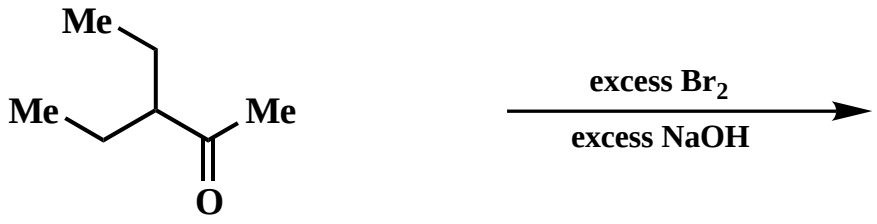
Enolate Reactions

1. What are the expected major organic products of the following reactions?

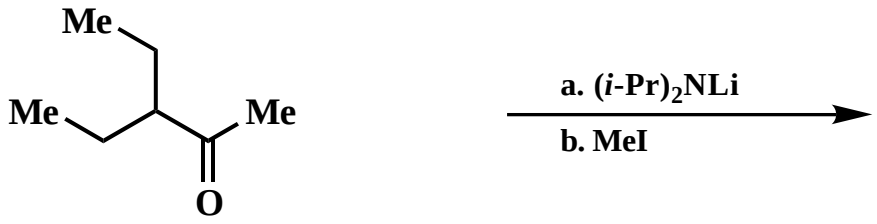
a.



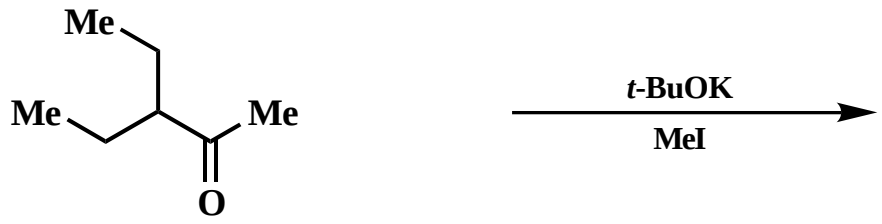
b.



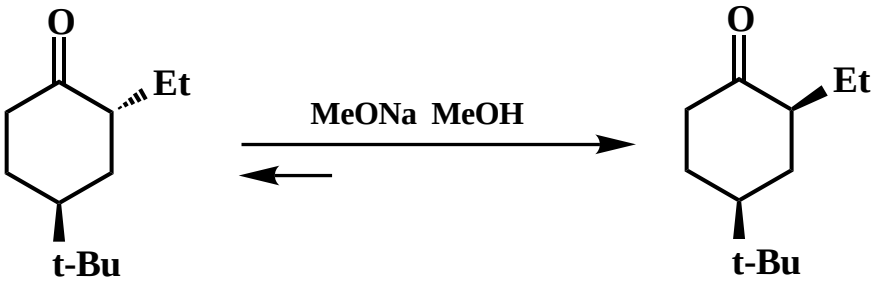
c.



d.

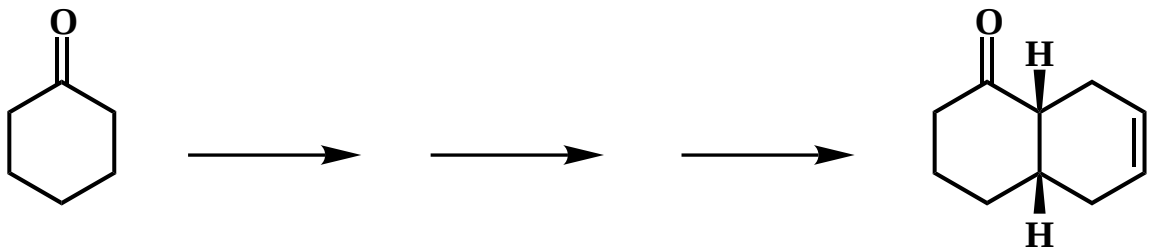


2. When the *trans*-2,4-disubstituted cyclohexanone **1** is exposed to sodium methoxide in methanol, it is converted substantially into the *cis*-isomer **2**. Equilibrium conditions provide approximately a 96:4 mixture of ketone **2**:ketone **1**. Draw the mechanism of this isomerization reaction using the curved arrow notation to indicate the reorganization of electron density. Show all intermediates and denote lone pairs and formal charges where appropriate. Explain why ketone **2** is more stable than ketone **1**.



1 **2**

3. How would one effect the following overall transformation, to convert cyclohexanone into a racemic modification of the bicyclic ketone **3**?



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