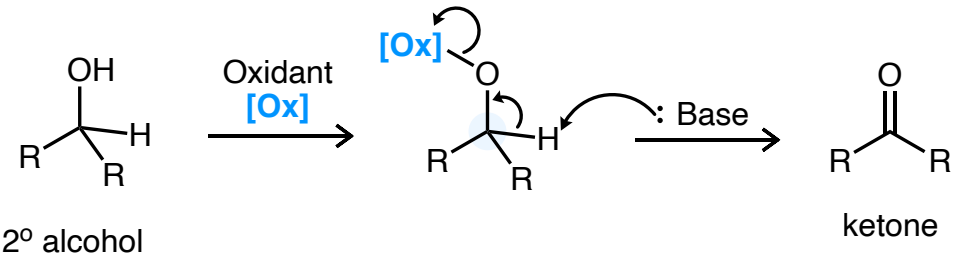
Reduction and Oxidation

1. The generic mechanism for the oxidation of an alcohol is shown below. It is helpful to notice that it is similar to a mechanism you learned in organic chemistry 1 (S_N1, S_N2, E1, or E2).



2º alcohol ketone

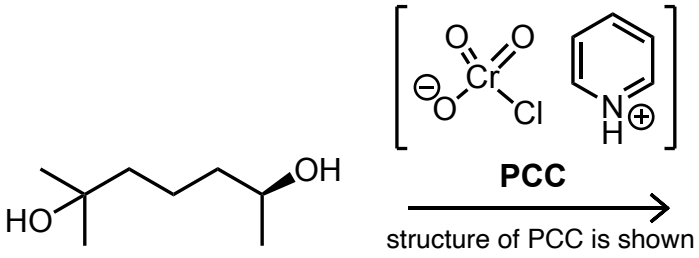
A. **Identify the most similar reaction** (**S_N1, S_N2, E1, or E2**) to the alcohol oxidation mechanism.

B. **Draw a generic mechanism** for the reaction you selected.

C. **Describe the similarities** between the oxidation mechanism and the reaction mechanism from part B.

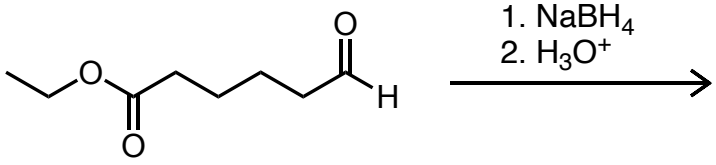
2. Draw the **single major product** of each reaction below. Describe in your own words why the reaction only takes place at one position/site within the starting material.

A.

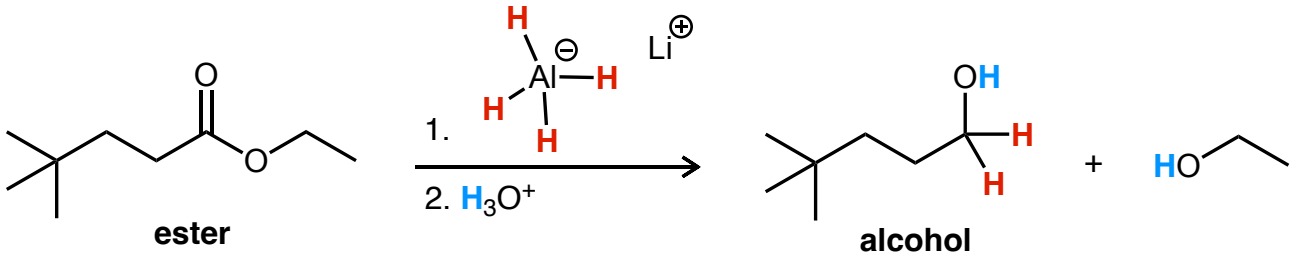


2. Draw the **single major product** of each reaction below. Describe in your own words why the reaction only takes place at one position/site within the starting material.

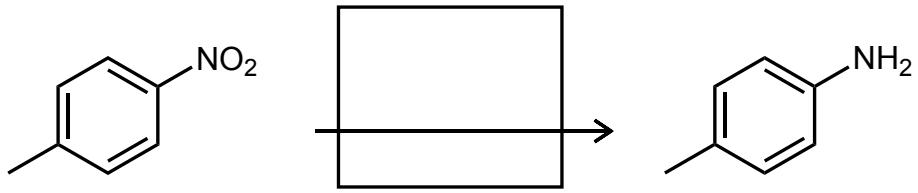
B.

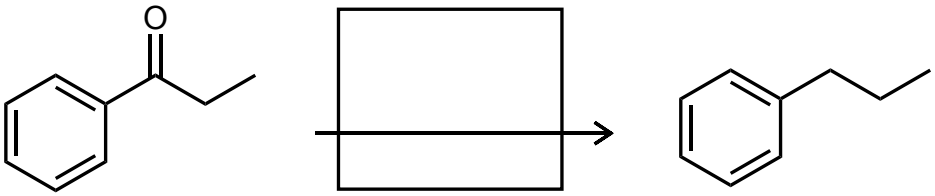


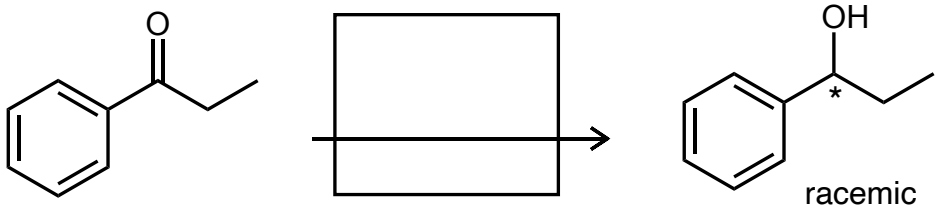
3. Draw the **curved-arrow mechanism** for the **full reduction of an ester to an alcohol** using excess $LiAlH_4$.

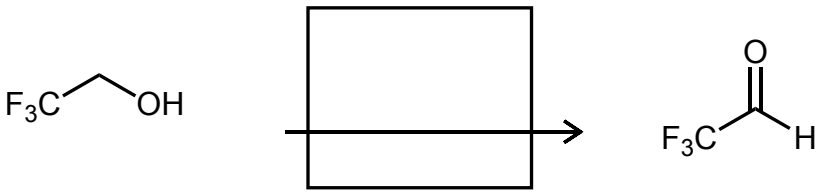


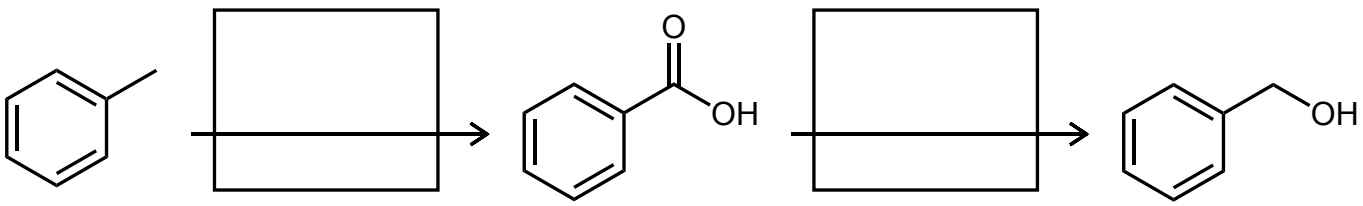
4. **Select the correct reagent** that would promote each reaction shown. Then, **define** it is either a **reduction** or an **oxidation**.











List of Reagents

1. $NaBH_4$
2. H_3O^+

1. $LiAlH_4$
2. H_3O^+

PCC or
DMP or
Swern

H_2, Pt

H_2
Lindlar's catalyst

1. $KMnO_4$, NaOH
2. H_3O^+

5. **Provide the missing reagents and intermediate products** needed to complete the multi-step synthesis below.

Note: You will need to use other reactions you know in combination with the reduction and oxidation reactions to solve these syntheses.