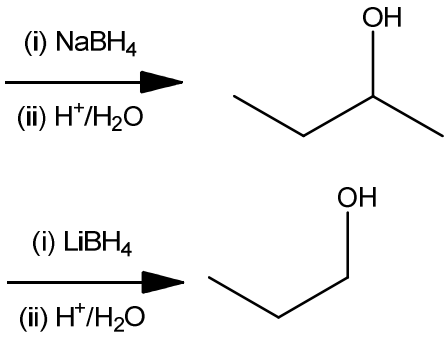
CHEM1002 Worksheet 7 – Answers to Critical Thinking Questions

The worksheets are available in the tutorials and form an integral part of the learning outcomes and experience for this unit.

Model 1: Addition to a Carbonyl

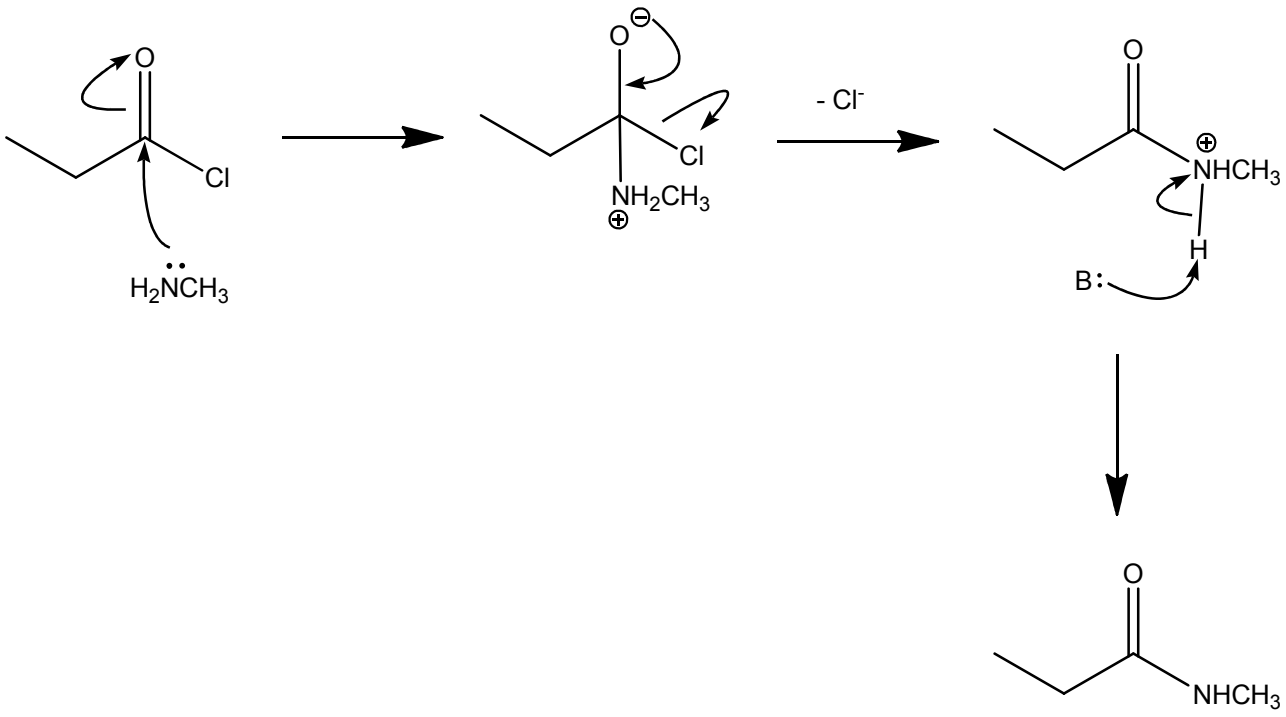
1. See below.



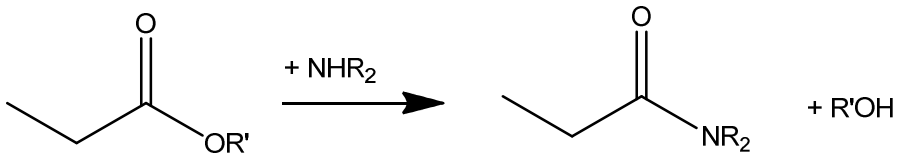
2. The first product is chiral and a racemic mixture will be produced. The second product is achiral.

Model 2: Carboxylic Acid Derivatives

1. See below. The base, B, could be solvent or H_2NCH_3.

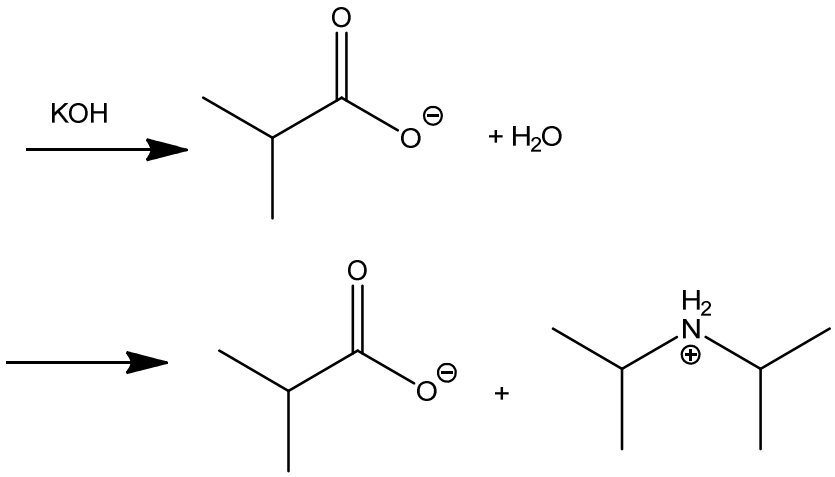


2. Addition of an amine:



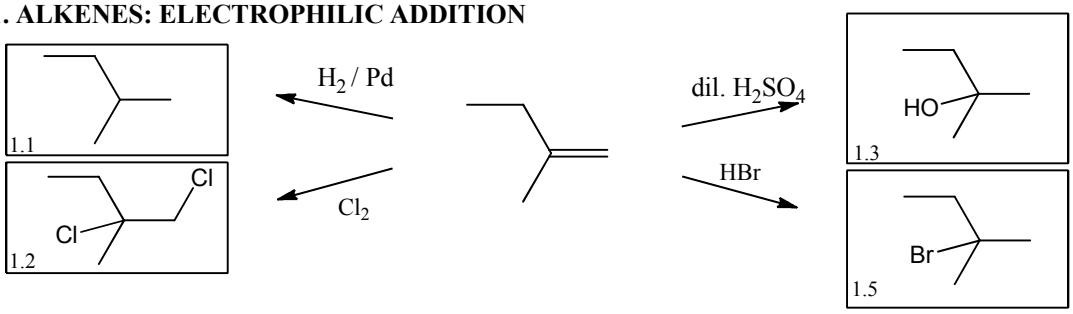
3. An alcohol (with its alkyl group corresponding, as shown above, to the –OR' group in the ester.

4. Simple H^+ transfer reactions occur:

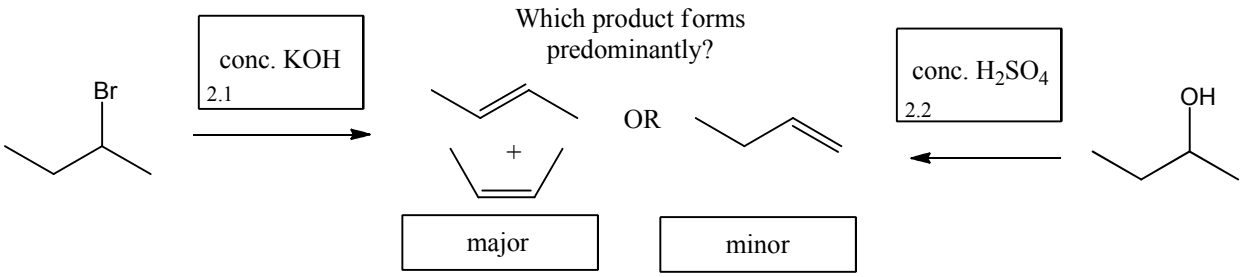


SUMMARY OF ORGANIC REACTIONS

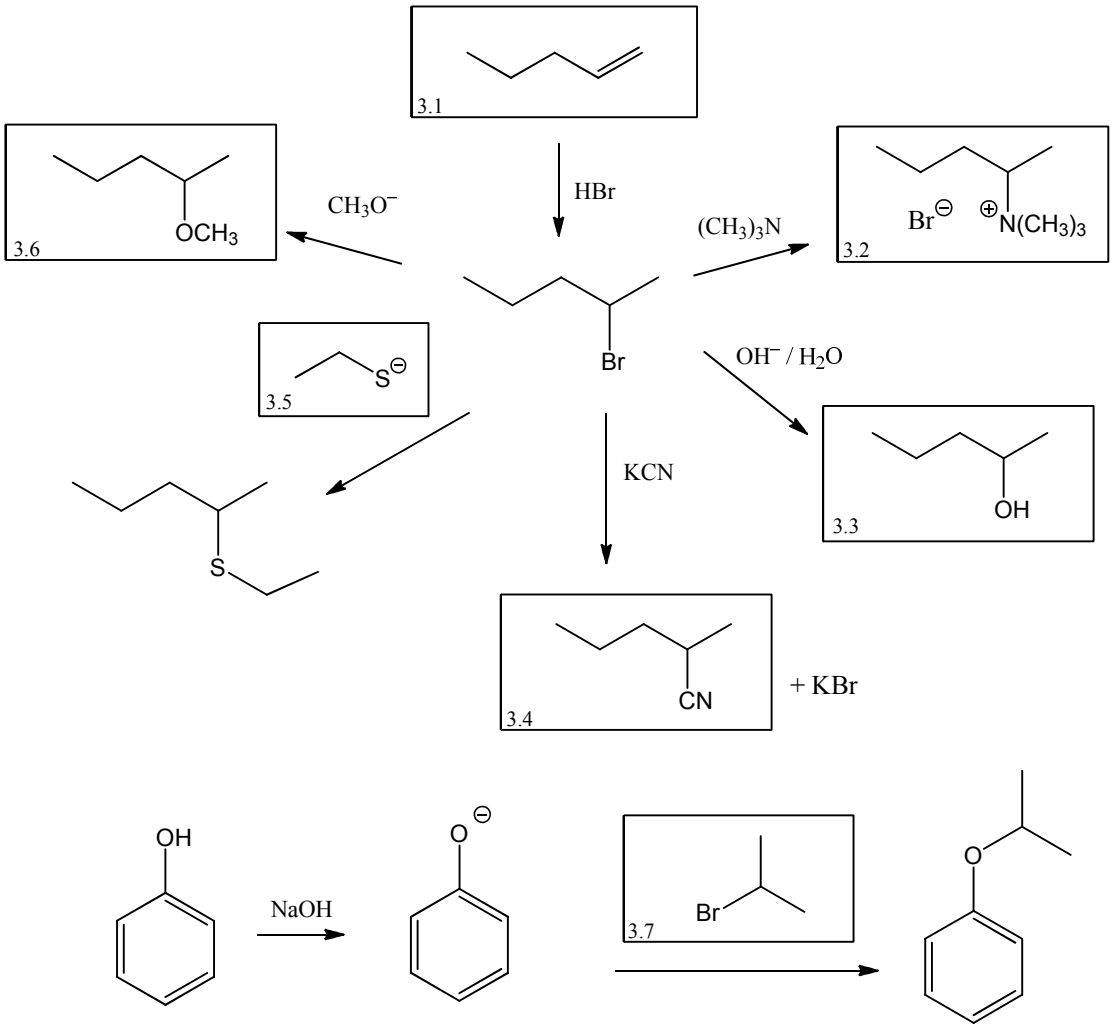
1. ALKENES: ELECTROPHILIC ADDITION



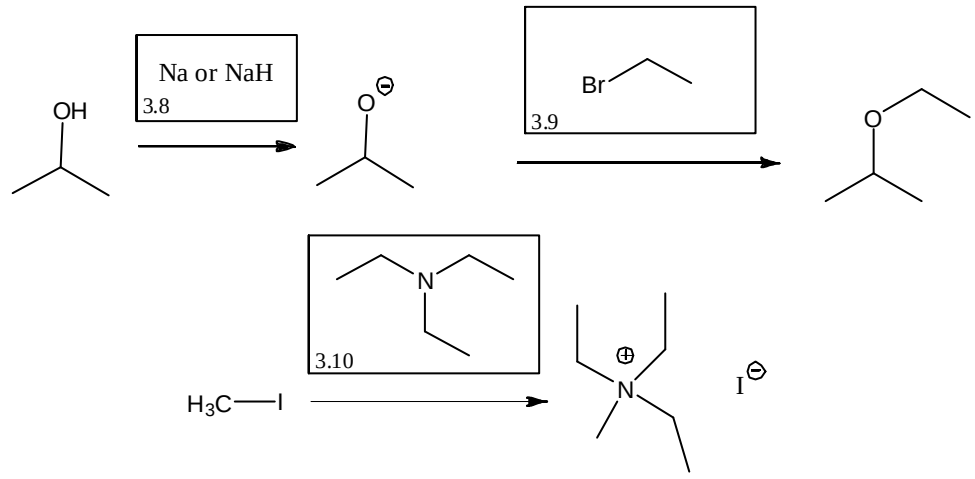
2. ALCOHOLS AND ALKYL HALIDES: ELIMINATION



3. ALCOHOLS, AMINES AND ALKYL HALIDES: NUCLEOPHILIC SUBSTITUTION



3. NUCLEOPHILIC SUBSTITUTION (Continued)



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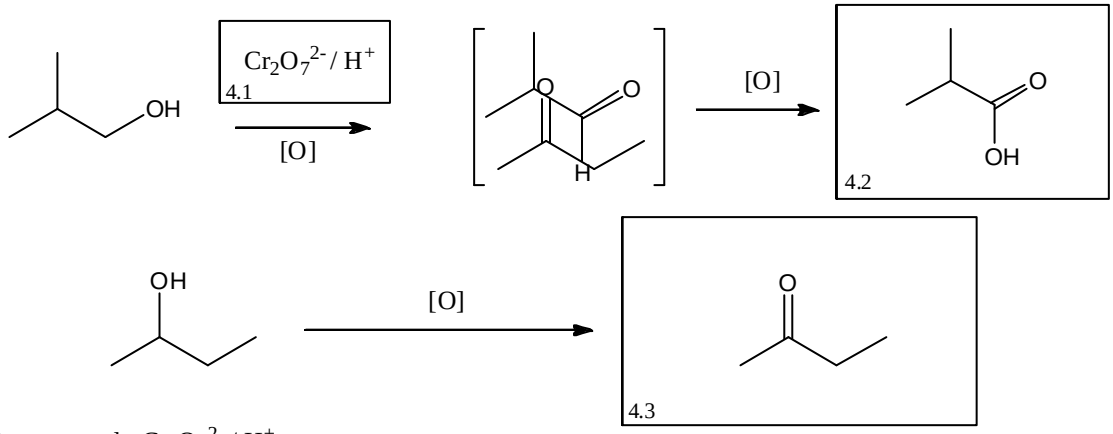
4. ALCOHOLS, ALDEHYDES AND KETONES: OXIDATION



[O] is commonly $Cr_2O_7^{2-}$ / H^+

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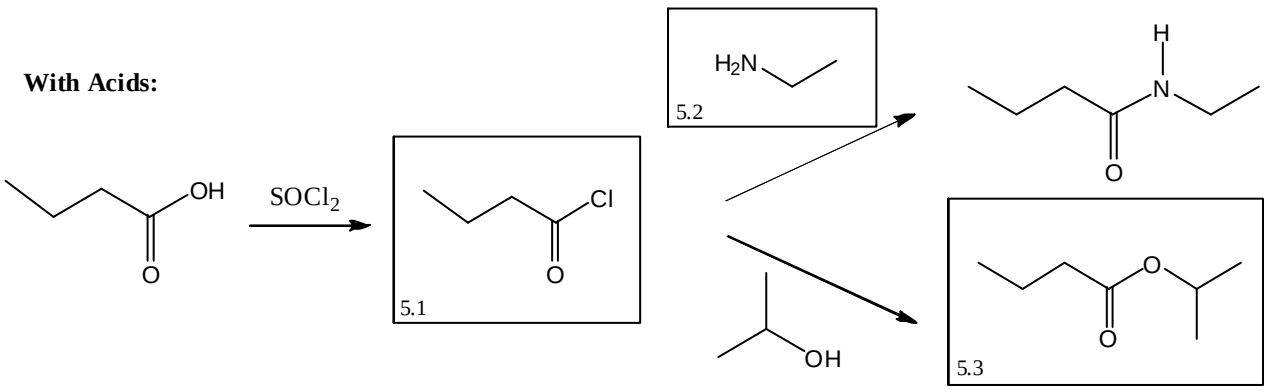
5. CARBOXYLIC ACID DERIVATIVES: NUCLEOPHILIC SUBSTITUTION

With Acids:



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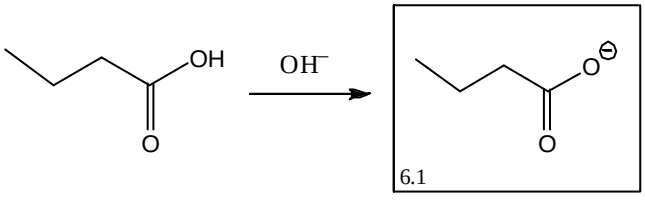
6. CARBOXYLIC ACIDS AND AMINES: ACID/BASE PROPERTIES

Acids:



Acids: