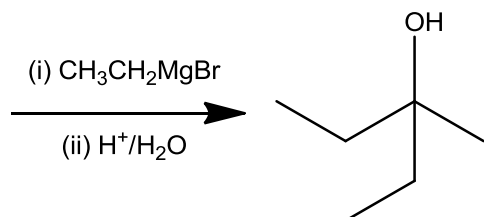
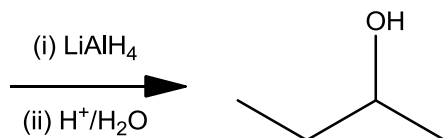


CHEM1611 Worksheet 8 – Answers to Critical Thinking Questions

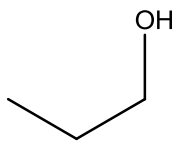
The worksheets are available in the tutorials and form an integral part of the learning outcomes and experience for this unit.

Model 1: Addition to a Carbonyl

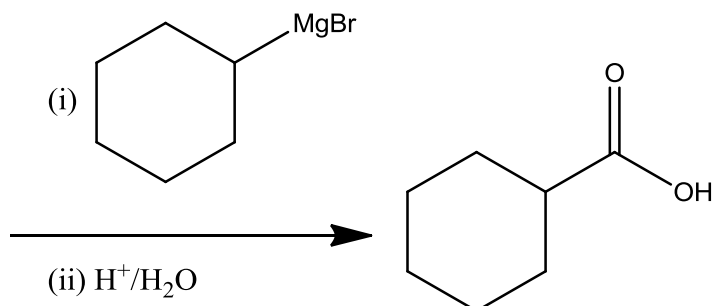
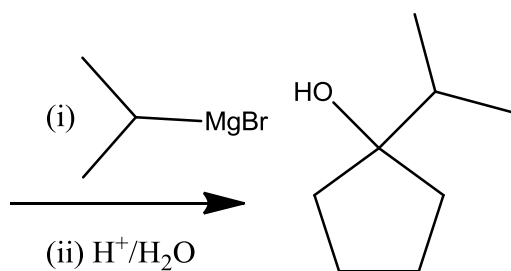
1. See below.



2. LiAlH_4 will reduce a carboxylic acid to the carbonyl level. The carbonyl will *also* be reduced. The overall reaction therefore results in reduction all the way to the alcohol:



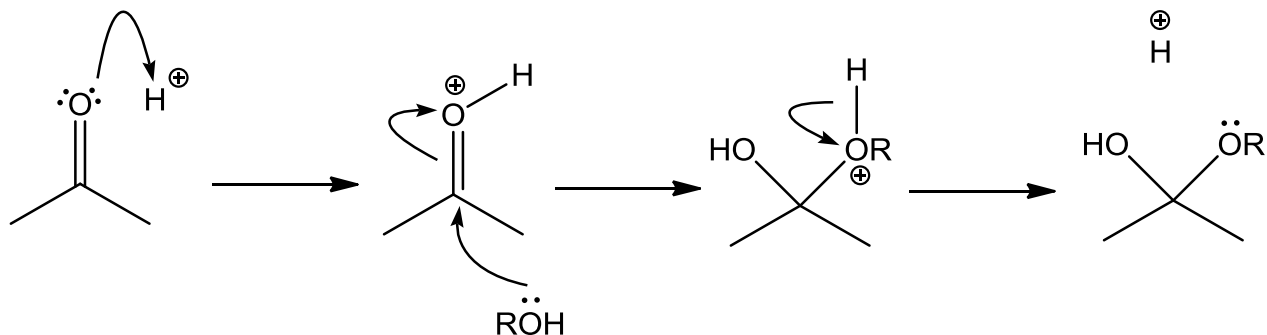
3. See below.



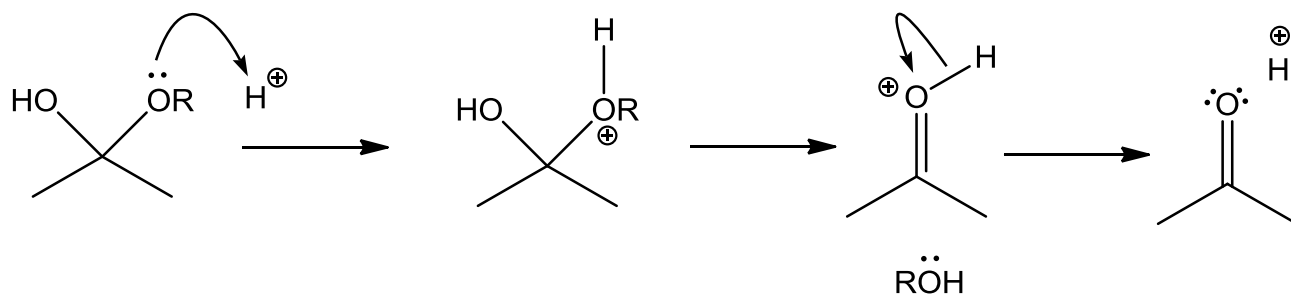
Extension: Acid would react directly with the Grignard, leading to the formation of the alkane.

Model 2: Alcohol Addition – Water Elimination

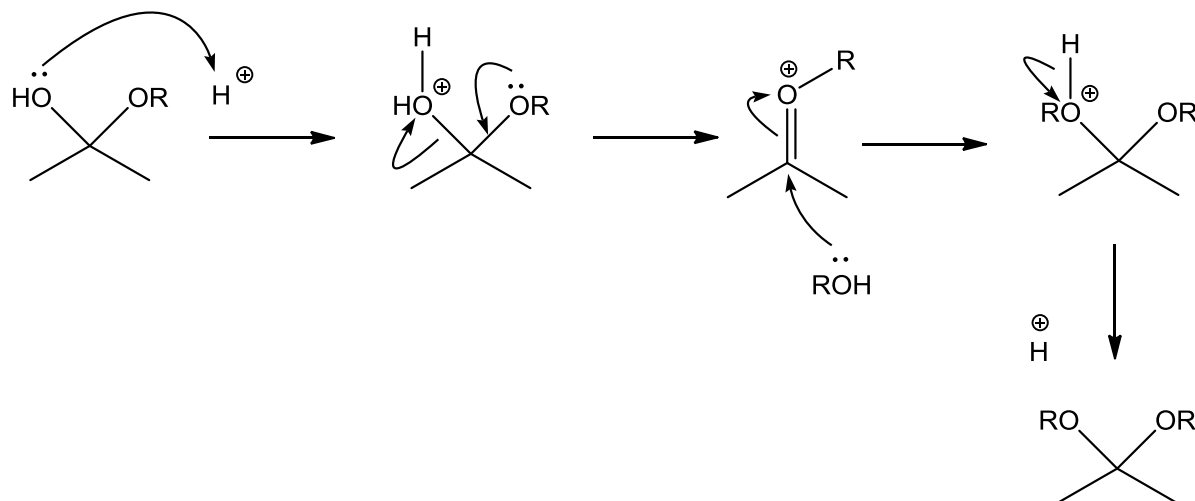
1. By protonating the carbonyl, it makes it much more susceptible to attack by nucleophiles. Even a poor nucleophile like water can then attack.
2. In the second step of the reaction, water is acting as a nucleophile. In the third step of the reaction, water is acting as a base.
3. See below.



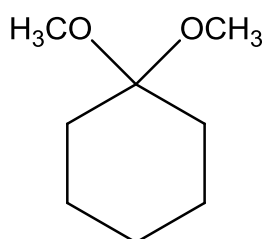
4. See below.



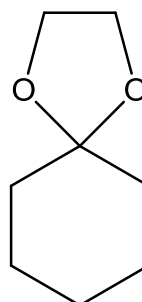
5. See below.



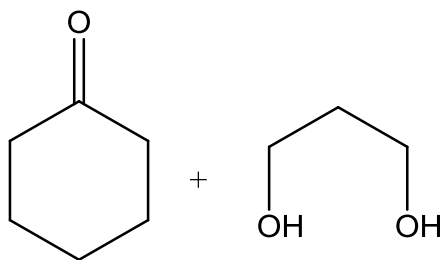
6. (a)



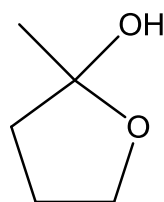
- (b)



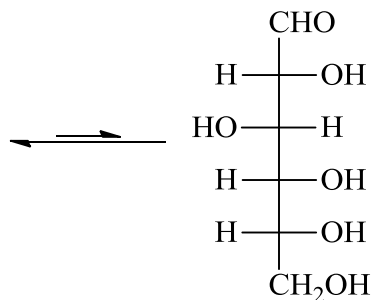
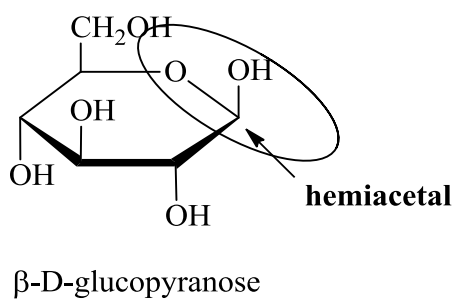
(c)



(d)



7. (a)



(b)

