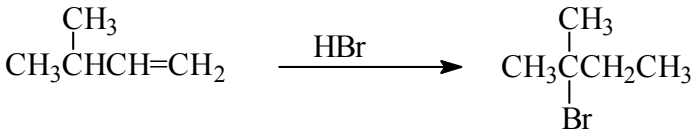
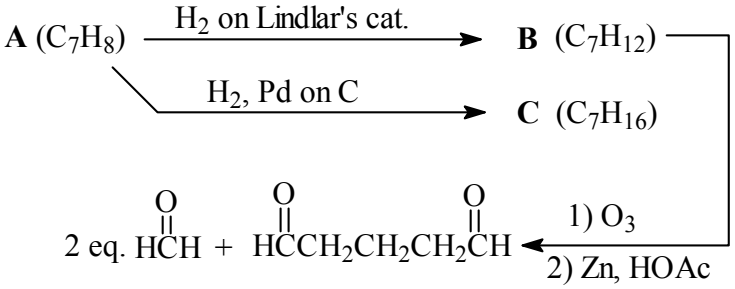
CHM 201 Chapters 7-9 practice

1.(8) Give the stepwise mechanism for the following reaction. Use arrows to indicate the electron flow and show any intermediates.



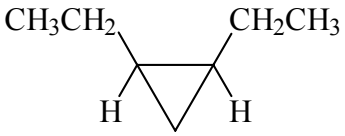
2.(14) An unknown compound (**A**) has a formula of **C_7H_8**. Treatment of **A** with H_2 on Lindlar's catalyst gives compound **B** (C_7H_{12}). Treatment of **A** with H_2/Pd on carbon (standard hydrogenation) gives compound **C** (C_7H_{16}). Ozonolysis of **B** followed by a Zn/acetic work-up gives pentanedial and 2 equivalents of formaldehyde.



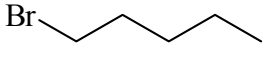
Propose structures for **A**, **B**, and **C** that are consistent with these data.

3.(14) Propose a sequence of steps that will allow for the transformations.

a) $CH_3CH_2C{\equiv}CH$ ⟶

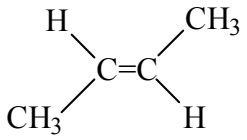


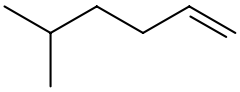
b) $HC{\equiv}CH$ ⟶

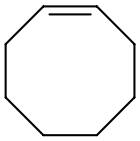


4.(36) Draw the major organic structure for the following reactions:

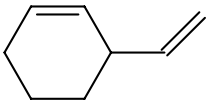
a) $HC{\equiv}CCH_2CH_2CH_3$ $\xrightarrow{\text{2 eq. HBr}}$

b)  $\xrightarrow[\text{in } CH_2Cl_2\text{, room temp.}]{CH_2I_2\text{ , }(CH_3)_3Al}$

c)  $\xrightarrow[\text{2) } H_2O_2\text{, } OH^-]{\text{1) } BH_3\text{-THF}}$

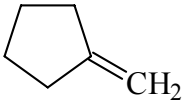
d)  $\xrightarrow{Br_2}$

e) $(CH_3)_2CHCH_2C{\equiv}CH$ $\xrightarrow[H_2SO_4,\ H_2O]{HgSO_4}$

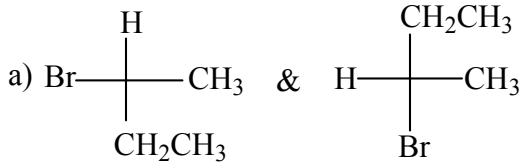
f)  $\xrightarrow{H_2,\ 10\%\ Pd\ on\ C}$

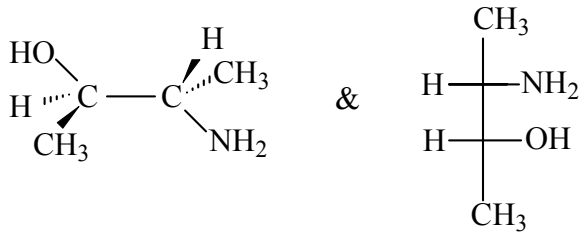
g) $CH_3CH_2CH_2C{\equiv}CH$ $\xrightarrow[\text{2) } CH_3Br]{\text{1) } NaNH_2 \text{ in } NH_3\ (l)}$

h) $CH_3CH_2C{\equiv}CCH_2CH_3$ $\xrightarrow[-78^oC]{\text{Li metal in } NH_3}$

i)  $\xrightarrow[\text{2) } NaBH_4]{\text{1) } Hg(OAc)_2 \text{ in THF/water}}$

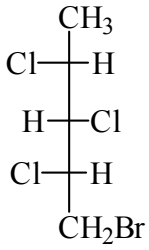
5.(12) Determine whether the following pairs of compounds are **identical**, **enantiomers** or **diastereomers**. **Also**, give the absolute configuration (**R or S**) for each chiral center.

a) 

b) 

6.(12) Compound **A** shown below has a specific rotation of –44°.

a) Identify the absolute configuration (R/S) for each chiral center in **A**.



A

b) Above, draw a Fischer projection of the enantiomer of compound **A**. What is its specific rotation? _____

c) How many total stereoisomers are there of compound **A**? _____

d) Draw two pairs of enantiomers (4 structures) that are stereoisomers of **A**.

Are there any meso compounds? _____ If so, draw one.