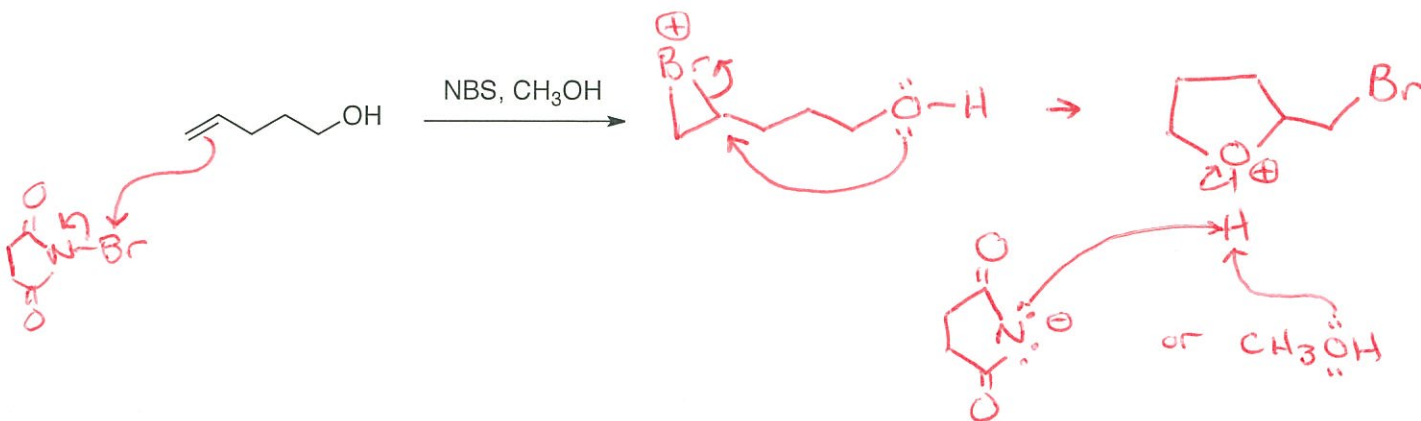


CHAPTER 8. PRACTICE PROBLEMS

Treating 4-penten-1-ol with bromine in water forms a cyclic bromoether. Draw an arrow-pushing mechanism that accounts for this transformation:

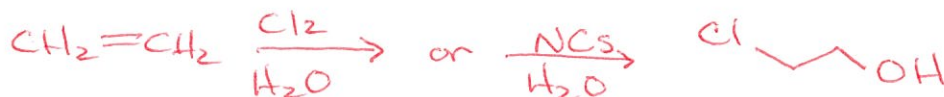


How do you convert ethene to these compounds (what are the reagents necessary)?

a. Ethane



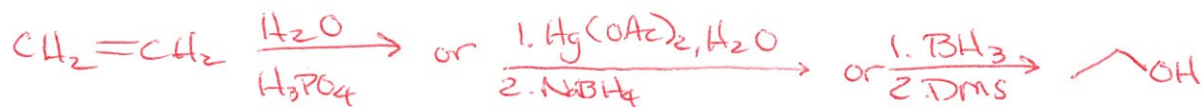
b. chloroethanol



c. chloroethane



d. ethanol



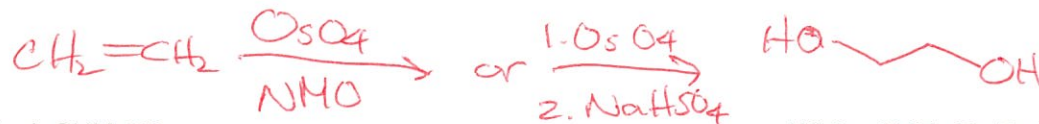
e. 1,2-dibromoethane



f. bromoethane



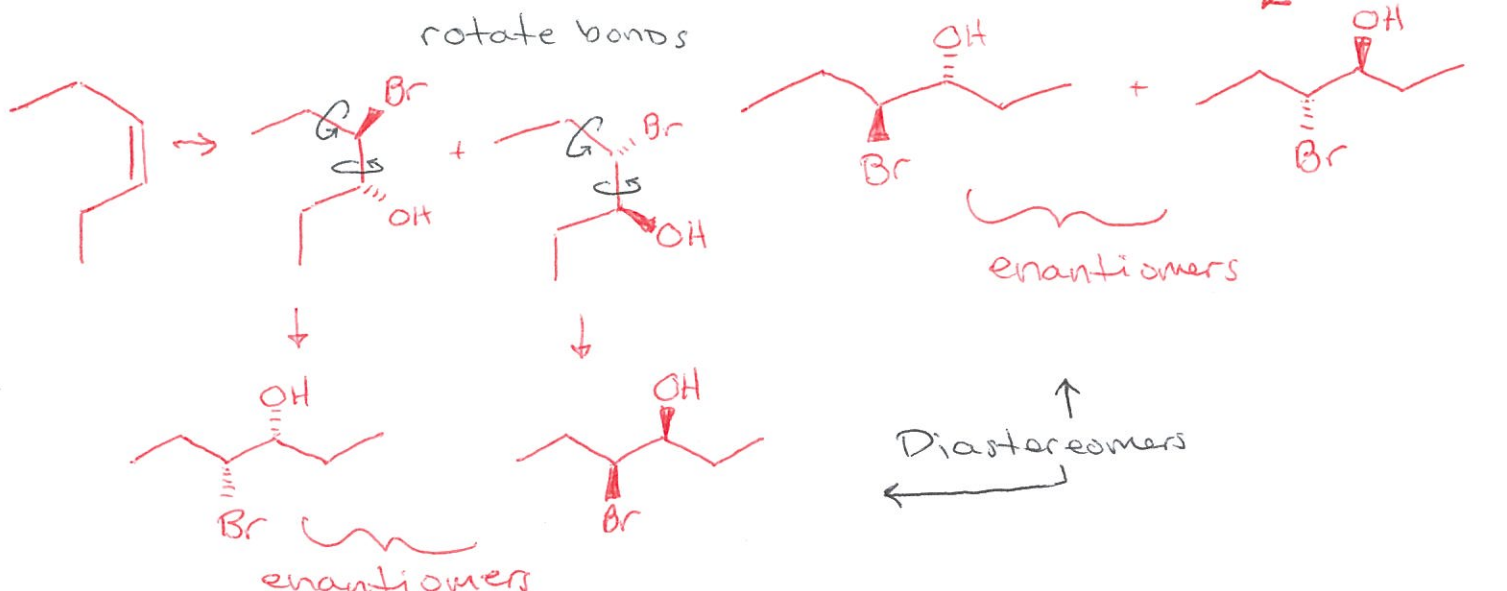
g. 1,2-ethanediol



Draw the products of these two reactions - are the products any different?

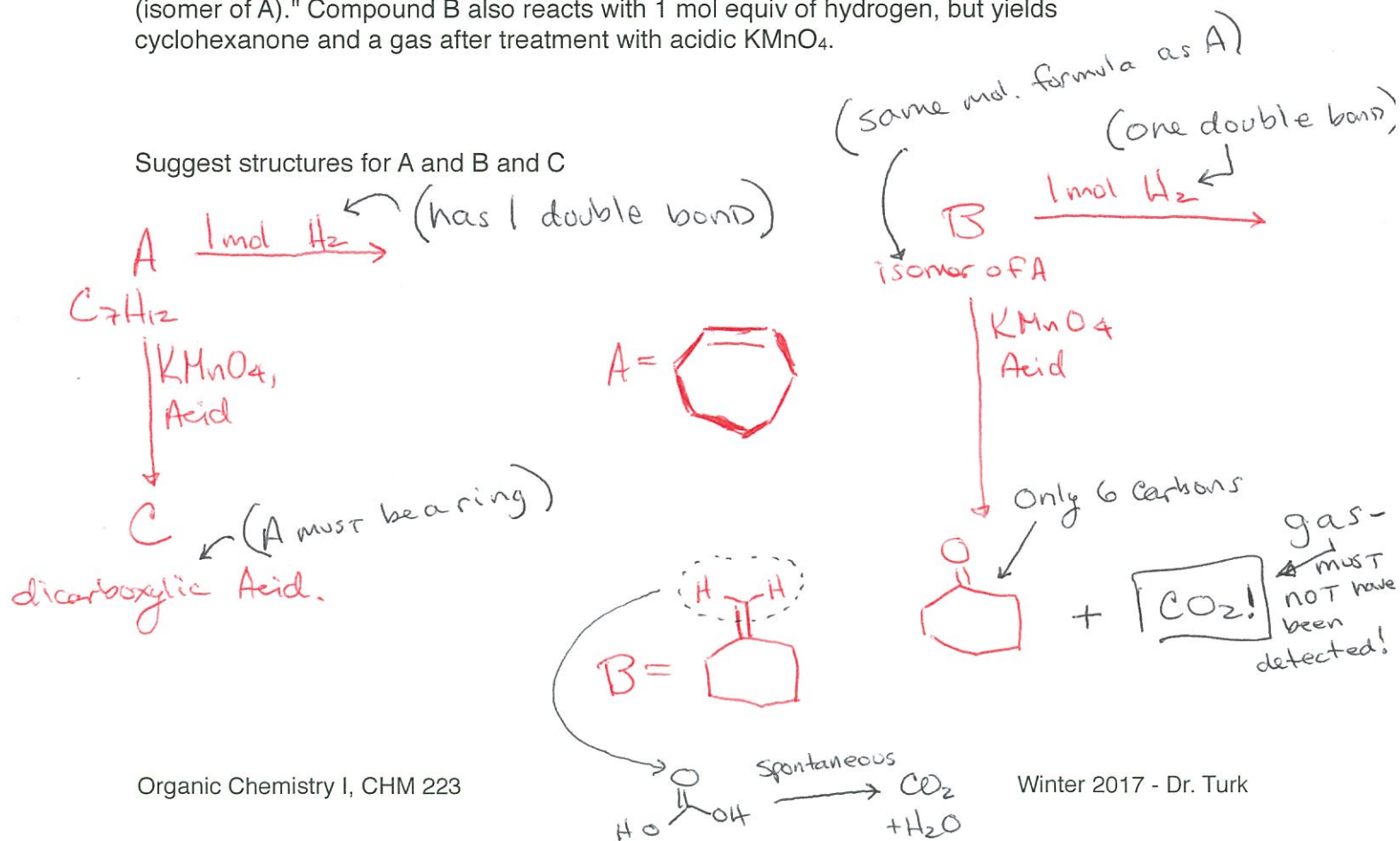
a. *cis*-3-hexene + Br₂/H₂O

b. *trans*-3-hexene + Br₂/H₂O

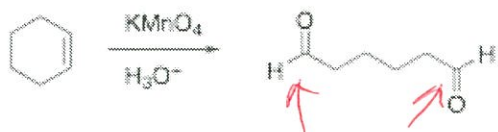


In an abandoned laboratory has been found a flammable liquid, A, in a bottle bearing only the label "Compound A: C₇H₁₂." Government agents have offered you a considerable sum to determine the structure of this compound. After verifying the molecular formula by elemental analysis, you find that Compound A reacts with 1 mol equiv of hydrogen; and, after treatment with acidic KMnO₄, Compound A gives the dicarboxylic acid C. Another bottle from the same laboratory is labeled "Compound B (isomer of A)." Compound B also reacts with 1 mol equiv of hydrogen, but yields cyclohexanone and a gas after treatment with acidic KMnO₄.

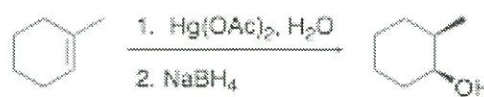
Suggest structures for A and B and C



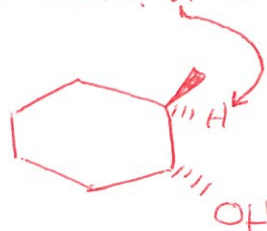
The products of the following reactions are written incorrectly. What is wrong with each, and suggest the correct product structure.



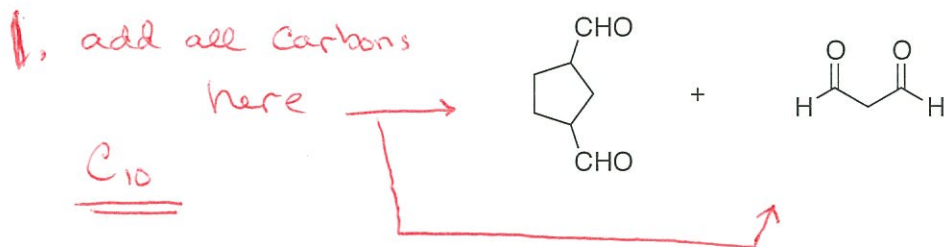
Should be carboxylic acids



OH & CH₃ should be trans
b/c OH & H should be cis

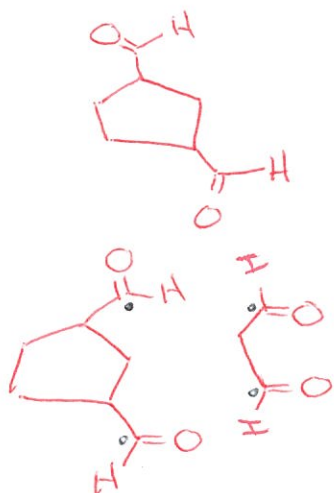


A hydrocarbon with the formula C₁₀H₁₄ is treated with ozone, then with acidic zinc in water. The products of the reaction are shown below. Write the structure of the hydrocarbon starting material.



2. So... these two molecules must have been joined together

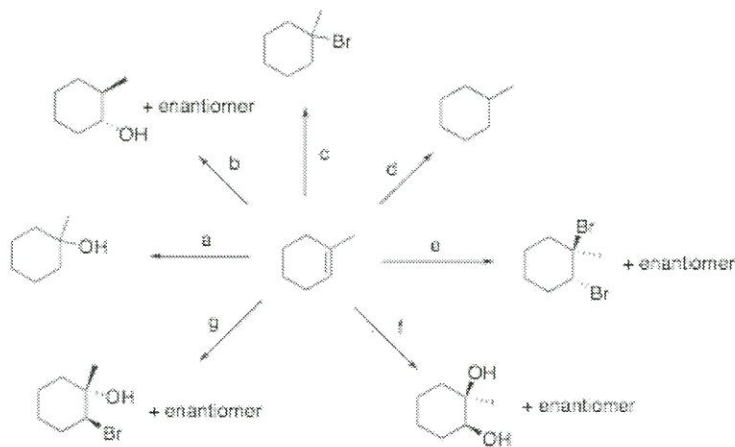
3. Redraw 1st molecule



4. Carbons w/ double-bonded oxygens used to be connected by double bond.



Show how you would synthesize each of the following compounds using methylenecyclohexane as your starting material.



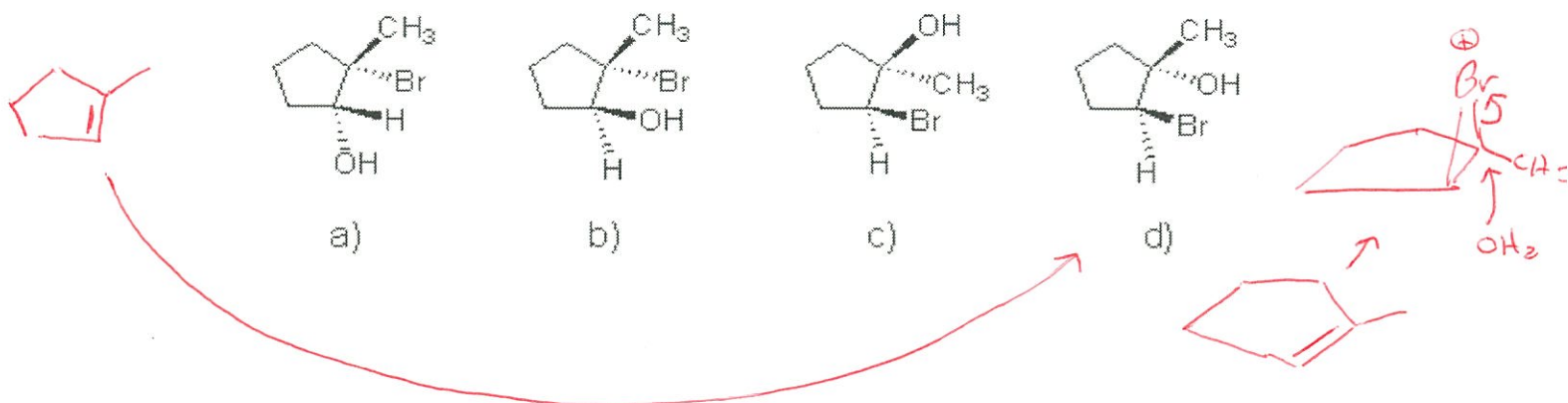
Enter the synthetic step (a-h) that would apply to each reagent set. More than one reagent (or set of reagents) may cause the same transformation – it is not necessary to chose BOTH, but just one that works. Not all reagents, below, are used.

both of these could work

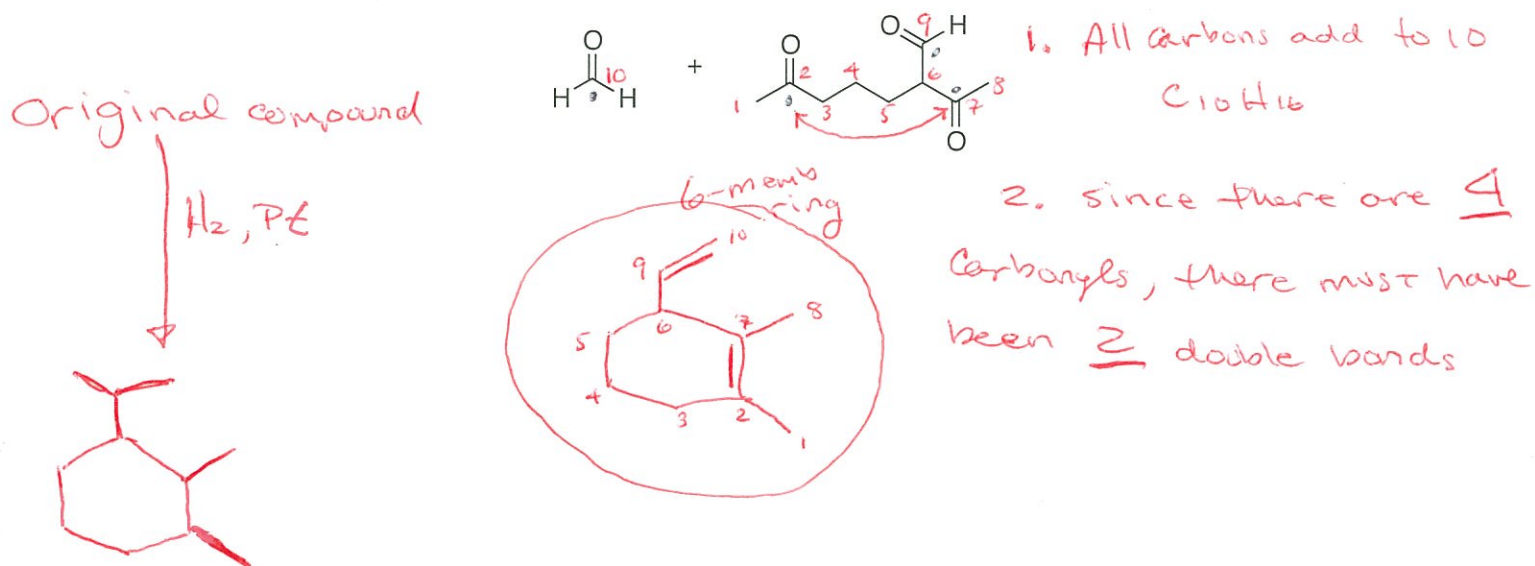
- | | | |
|---|---|---|
| <u>a</u> H ₂ O, H ₂ SO ₄ | <u>b</u> 1. BH ₃
2. NaOH, H ₂ O ₂
3. H ₃ PO ₄ , H ₂ O | _____ 1. O ₃
2. (CH ₃) ₂ S |
| <u>a</u> 1. Hg(OAc) ₂ , H ₂ O
2. NaBH ₄ | <u>f</u> 1. OsO ₄
2. NaHSO ₃ , H ₂ O | <u>e</u> Br ₂ |
| _____ CH ₃ OH, H ₂ SO ₄ | _____ HIO ₄ , H ₂ O | <u>g</u> Br ₂ , H ₂ O |
| <u>c</u> HBr | _____ KMnO ₄ , H ₂ O, H ₃ PO ₄ | _____ Cl ₂ , H ₂ O |
| <u>d</u> H ₂ , Pd-C | | |

acid workup

Which of the compounds will result from the reaction of NBS/H₂O/DMSO with 1-methylcyclopentene?



A compound of formula $C_{10}H_{16}$ is treated with ozone, then with acidic zinc in water. The products of this reaction are shown below. When the original compound is treated with excess H_2 / Pt , 1-isopropyl-~~3~~2,3-dimethyl methylcyclohexane is formed. Write the structure of the original compound.



Which of the following compounds would yield the trialkylborane shown below when treated with BH_3 / THF ?

