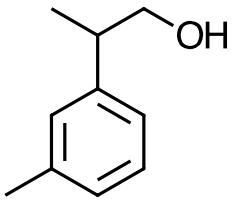
CHM 3343 Exam 1

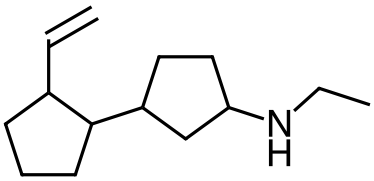
TUD Department of Chemistry
Spring 2017

1) [20pts] Fill in the table with the expected results* of the simple chemical tests for compounds A-D

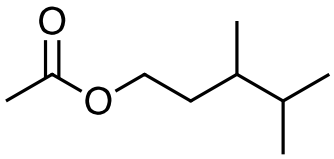
Test\Compound	A	B	C	D
soluble in water				
sol in conc H_2SO_4				
sol in dil aq HCl				
sol in dil. aq NaOH				
bubbles in aq $NaHCO_3$				
decolorizes Br_2/CCl_4				



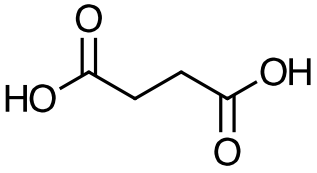
A



B



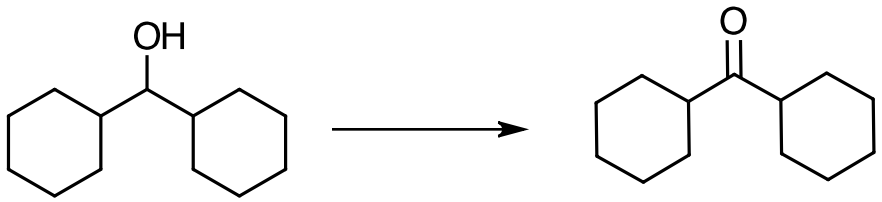
C

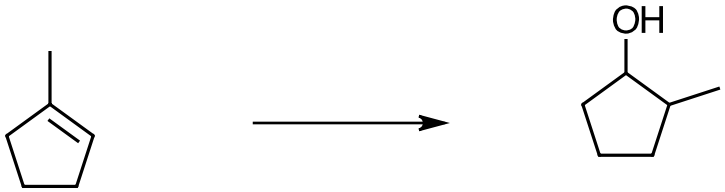


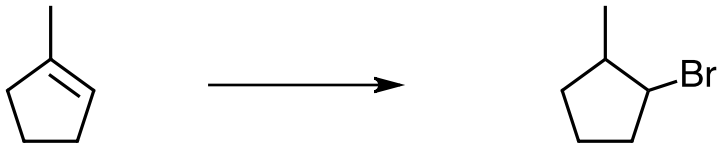
D

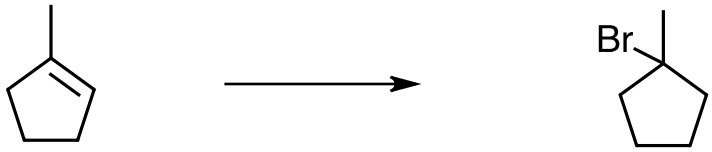
*Note: A zero for the solubility tests means the compound is insoluble in that reagent; a plus means the compound is soluble. A plus for Br_2/CCl_4 means the orange bromine color is discharged; a zero means the color remains. A zero for $NaHCO_3$ means no CO_2 bubbles are produced; a plus means CO_2 is evolved.

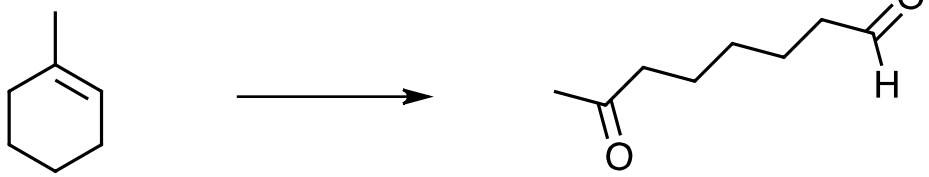
2) [40 pts] Place the appropriate reagents over the arrows for the following reactions:



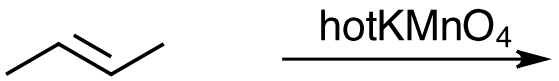


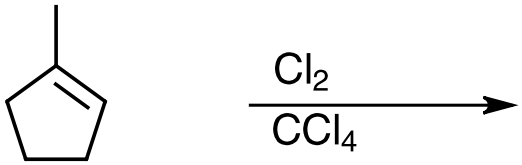


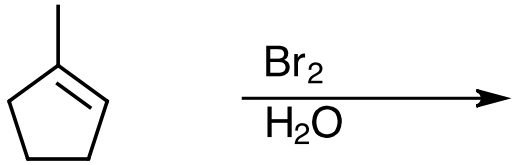


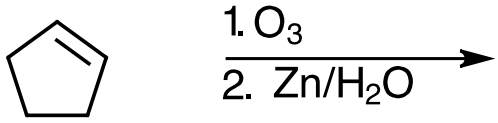


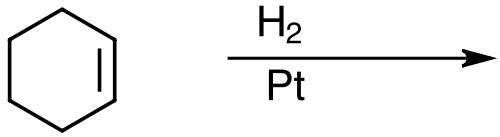
3) [40 pts] Show the expected major organic products:



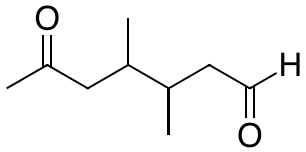






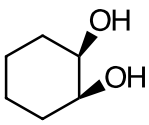


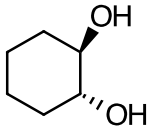
4) [20 pts] Ozonolysis of an alkene gave the product below. What was the alkene?



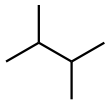
5) [10 pts] List three things that a carbocation can do:

6) [10 points] Beginning with cyclohexene, show how you would synthesize each of the following:



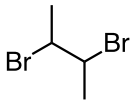


7) [20 points] Below each structure state the number of different protons and the number of different carbons::



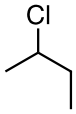
protons =

carbons =



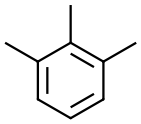
protons =

carbons =



protons =

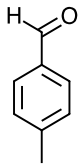
carbons =



protons =

carbons =

8) [20 points] Sketch the expected proton NMR and C-13 spectra for the following structure:



9) [20 points] Provide structures consistent with the provided information:

a) $C_4H_8O_2$ ∂ 1.2 triplet 3 H

∂ 2.1 singlet 3 H

∂ 4.1 quartet 2 H

strong IR absorption at ~1740 cm^{-1}

b) $C_5H_8Br_4$ ∂ 3.6 singlet 8 H