

CHEMISTRY 59-230-02

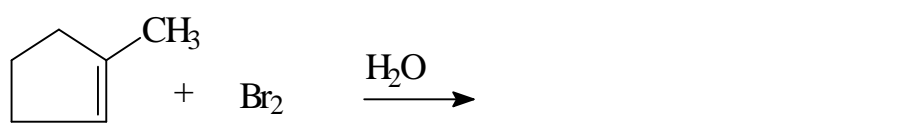
SECOND TEST

Time 50 Min

November 12, 1997

1. In each of the following reactions fill in the blanks with the correct structural formula. If stereochemistry is important, make sure your drawing shows it clearly. If a catalyst is required for a successful reaction, show it over the arrow. No mechanisms are required. [28 points]

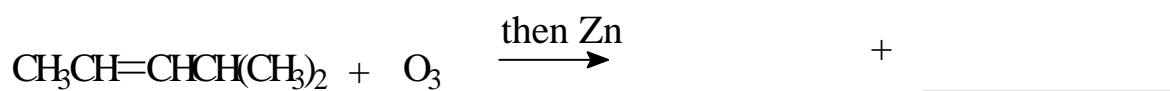
(a)



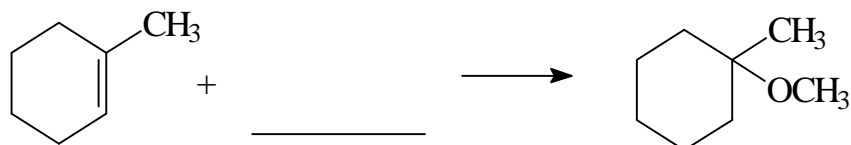
(b)



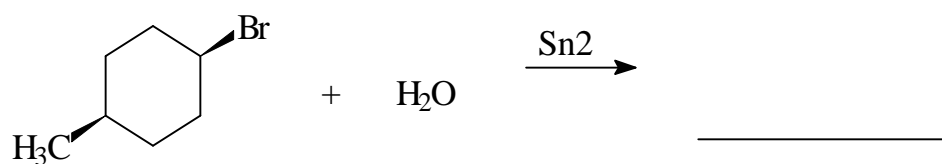
(c)



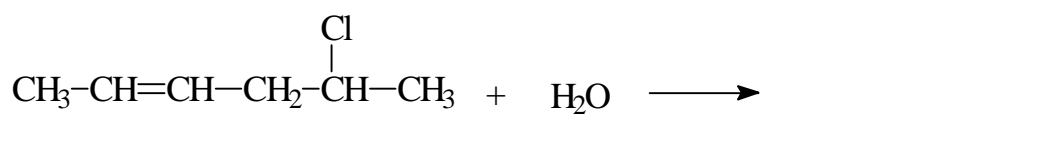
(d)



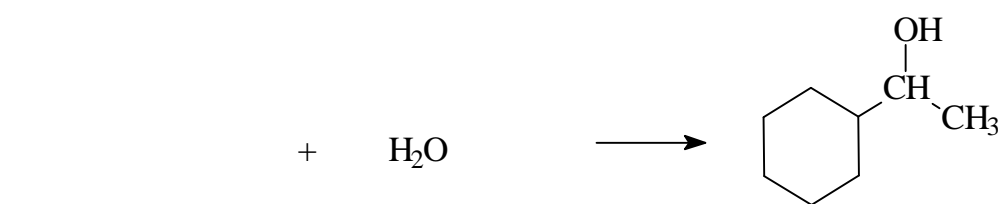
(e)



(f)

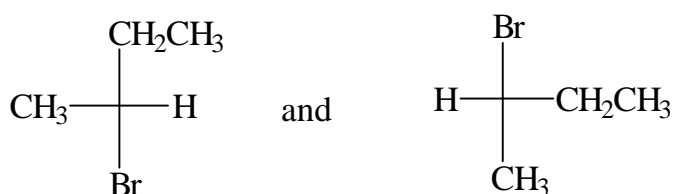


(g)

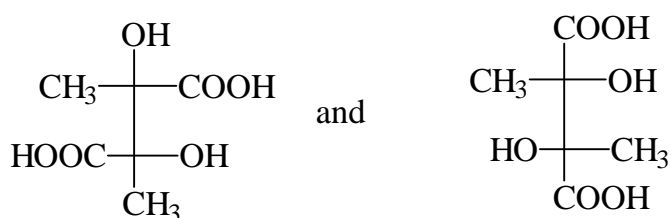


2. (a) Pick the word from the following list (enantiomer, diastereomer, identical) that correctly describes the relationship between each of the following pairs of molecules. [20 points]

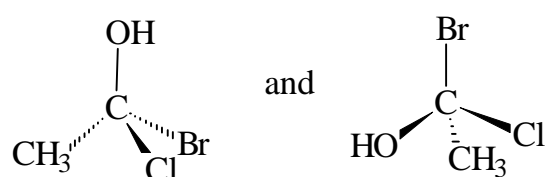
(i)



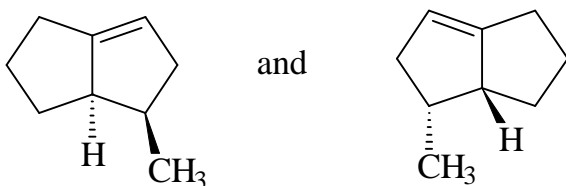
(ii)



(iii)



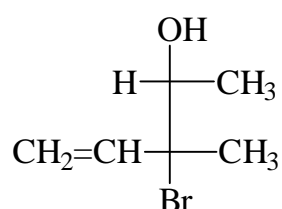
(iv)



(b) Which of the drawings in question 2(a)(ii) represent a meso form?[5 points]

both left drawing right drawing neither

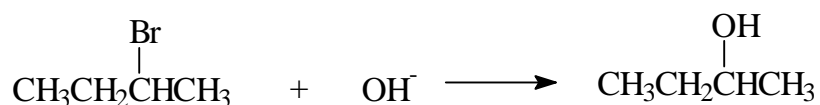
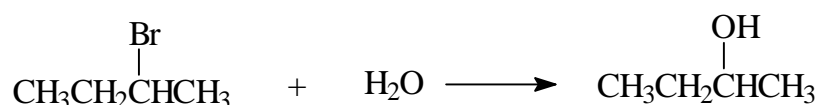
(c) Assign the correct stereochemical descriptor to each of the chiral centres in the following molecule. Show the priorities of each substituent around each centre. [10 points]



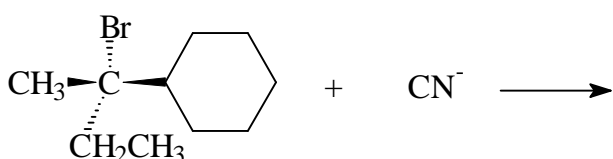
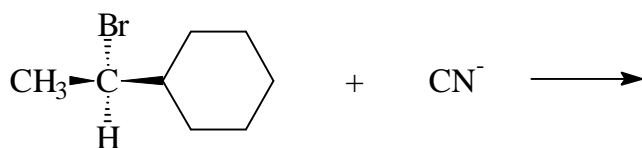
3. Draw the COMPLETE MECHANISM for the addition of methanol to 2-methyl-1-pentene. Make sure you show which steps are reversible. ALSO write the equation for the overall reaction. [15 points]

4. For the following pairs of reactions, answer the question asked **and give a reason for your answer.**

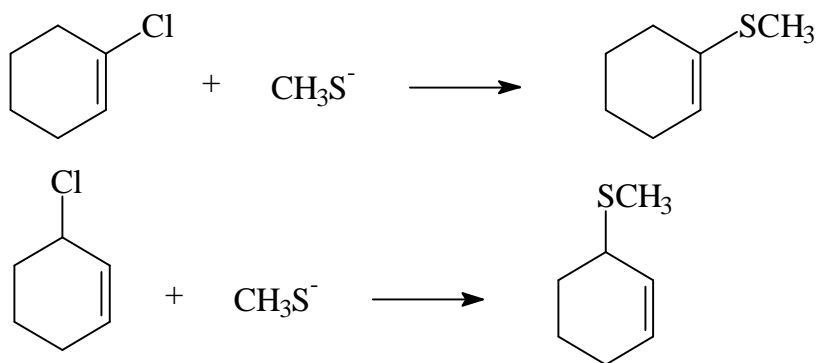
(a) Which reaction is more likely to proceed via a S_N2 mechanism AND WHY? [4 points each]



(b) Which reaction is more likely to give an optically active product AND WHY?



(c) Which reaction is more likely to give the indicated product AND WHY?



5. Show how you could carry out the following transformations: [10 points]

propene + _____ \longrightarrow 2-bromopropane

propene + _____ \longrightarrow $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$

propene + _____ \longrightarrow $\text{CH}_3\text{CH}=\text{O}$