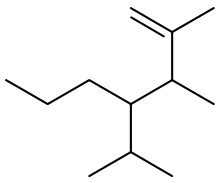
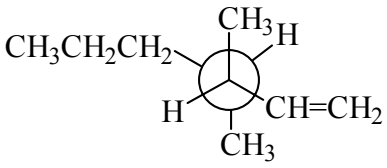
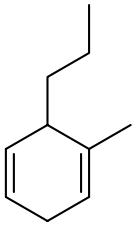
CHEM 241-CGS Name_____
Alkenes problem set

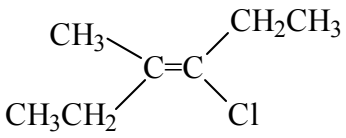
1.(16) Give the name of the following compounds. Be sure to Indicate stereochemistry where appropriate (e.g. *E* or *Z*).

a) 

b) 

4-isopropyl-2,3-dimethyl-1-heptene (S) 3,4-dimethyl-1-heptene

c) 

d) 

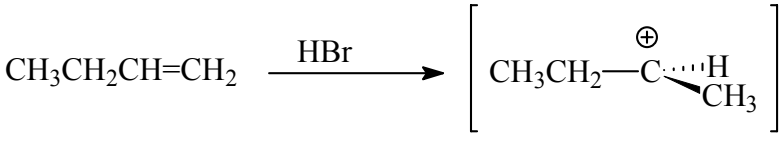
3-propyl-2-methyl-1,4-cyclohexadiene (Z) 3-chloro-4-methyl-3-hexen

2.(8) Arrange the following series of substituents in order of *increasing* E/Z priority where 1 = lowest and 4 = highest priority.

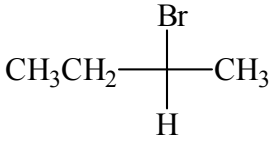
a) $-CH(CH_3)_2$ $-CH_2CH_2CH{=}CH_2$ $-CH_2CH_2CH_2CH_2Cl$ $-C(CH_3)_3$
3 2 1 4

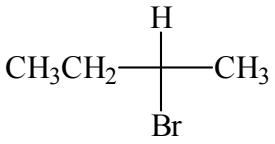
b) $-C{\equiv}N$ $-CH_2NH_2$ $-CO_2H$ $-CH_2CH_2Br$
3 2 4 1

3.(8) In the addition reaction of HBr to 1-butene, the product formed has a chiral center.
a) Draw the intermediate carbocation in this reaction.



b) How many stereoisomers can be formed of the final product? **2** Draw it (them) with Fisher projection(s).

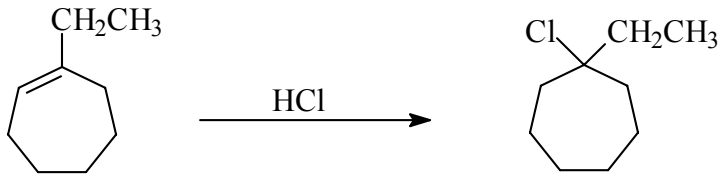




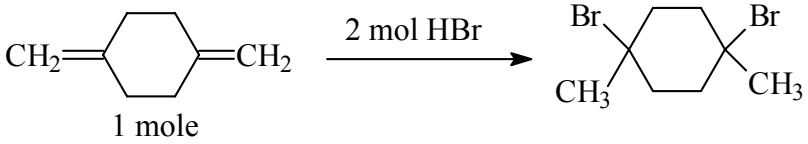
c) The product is not optically active (does not rotate the plane of plane-polarized light). Suggest a reason why. **A racemic mixture of the product is formed (Bromide has equal access to top and bottom of flat carbocation).**

4.(12) Give the major product for the following reactions:

a)

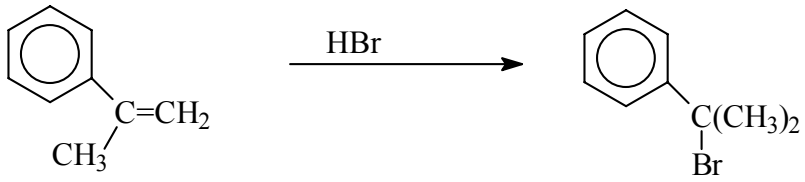


b)



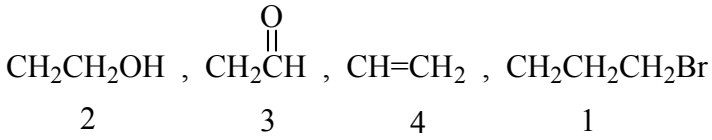
1 mole

c)

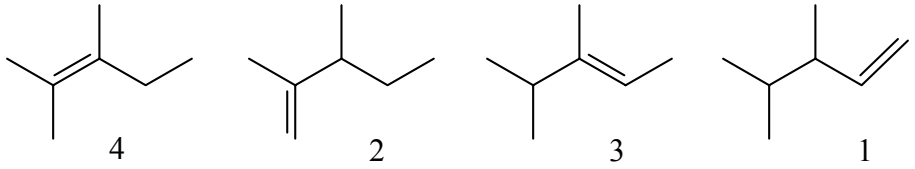


5.(12) Arrange the following in order of increasing (1= lowest or least)

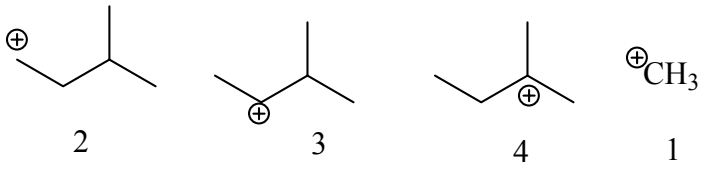
a) Cahn, Ingold Prelog priority (E,Z priority):



b) Stability (think heat of hydrogenation):



c) Stability:



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