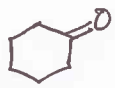
Problem Set

1. Give structures of alkenes that would give the following products upon ozonolysis - reduction.

a) $CH_3-\overset{O}{\overset{\|}{C}}-(CH_2)_3-\overset{O}{\overset{\|}{C}}-CH_2CH_3$ b)  and c) $CH_3CH_2CH_2CHO$

c) $Et-\overset{O}{\overset{\|}{C}}-{}^nBu$ and CH_3CH_2CHO

2. Show how would you accomplish the following conversions?

a) cis-3-hexene to meso-3,4-hexanediol

b) cis-3-hexene to (d,l)-3,4-hexanediol

c) trans-3-hexene to meso-3,4-hexanediol

d) trans-3-hexene to (d,l)-3,4-hexanediol

3. Predict the major products of the following reactions

a) cyclohexene + $CHCl_3$, 50% $NaOH / H_2O$

b)  + CH_2I_2, $Zn(Cu)$

4. When cyclohexene is treated with bromine in saturated aqueous NaCl, a mixture of trans-2-bromocyclohexanol and trans-1-bromo-2-chlorocyclohexane results. Propose a mechanism to account for these two products.

5. Predict the major product(s) for each reaction. Include stereochemistry where appropriate

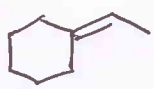
a) 1-methylcyclopentene + Cl_2 / H_2O b) 2-Me-2-butene + Br_2/H_2O

c) cis-2-butene + Cl_2 / H_2O

d) 1-Methylcyclopentene + Br_2 in saturated aqueous NaCl.

6. Predict major Pdt. with appropriate stereochemistry

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

b)  $\xrightarrow[ROOR]{HCl}$

c)  $\xrightarrow[(cold,\ dil)]{KMnO_4,\ OH^-}$

d)  $\xrightarrow[2)\ Me_2S]{1)\ O_3}$