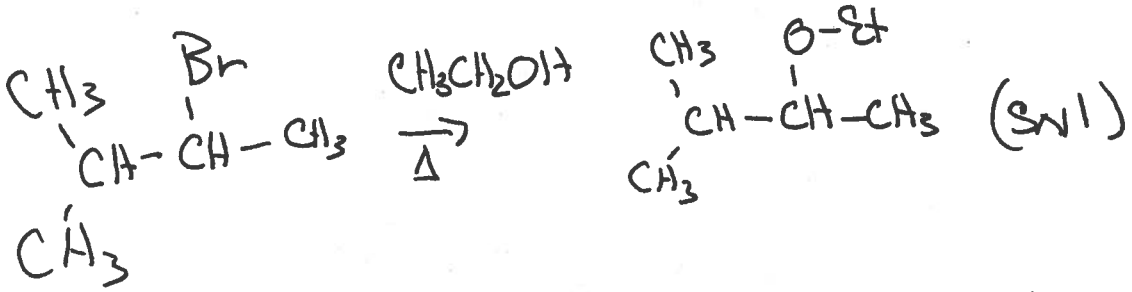
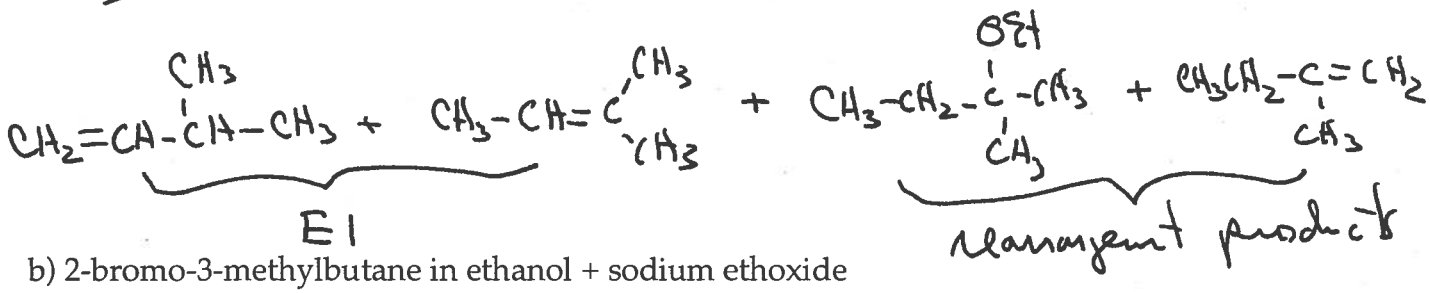
Chemistry 3311-100
Organic Chemistry / Dr. Barney Ellison
Thursday: April 17th @ **7:00pm → 9:00** / 2nd Exam / Math 100)

Name: Key (please print)

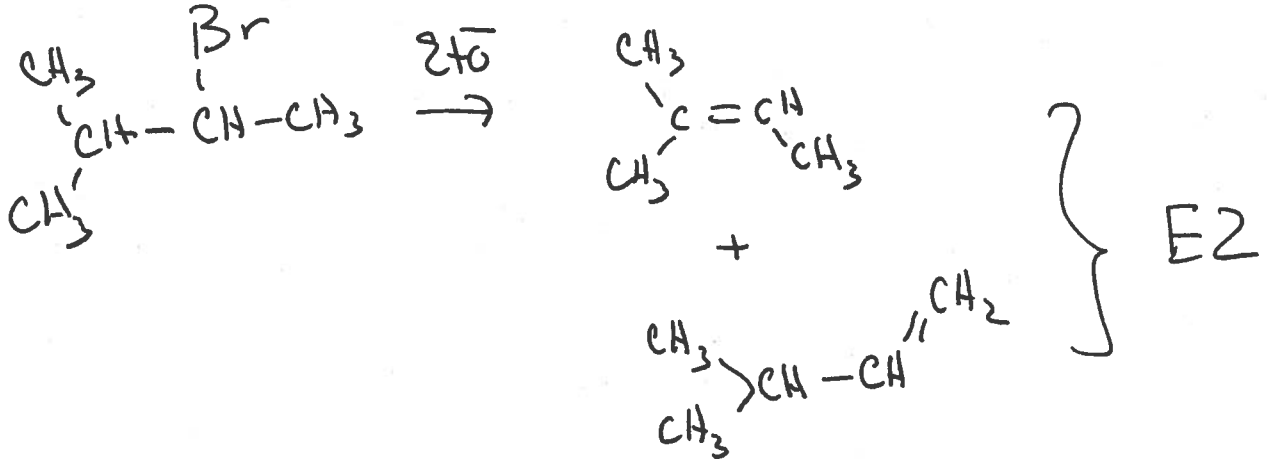
1. (20 pts) What are the products formed and by what mechanisms in each of the following? (hint — be careful to write out the chemical structures).

a) 2-bromo-3-methylbutane in hot ethanol



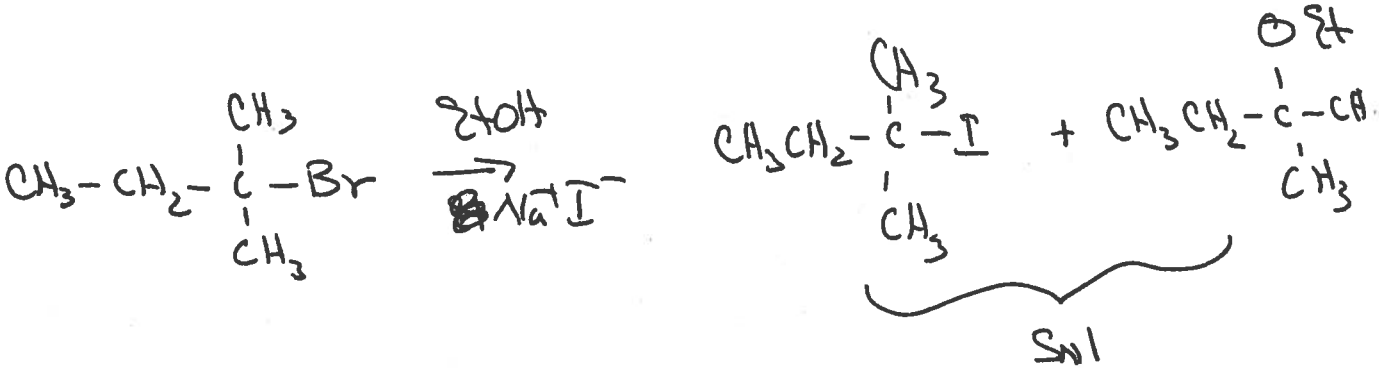


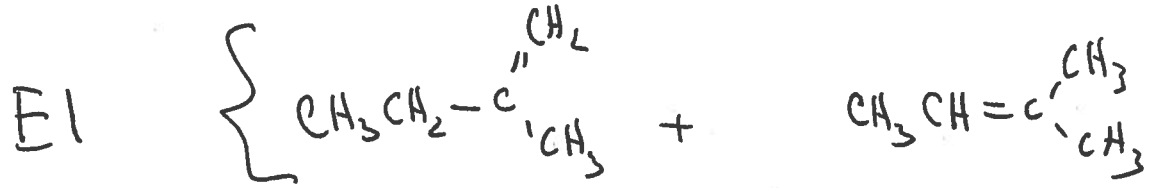
b) 2-bromo-3-methylbutane in ethanol + sodium ethoxide



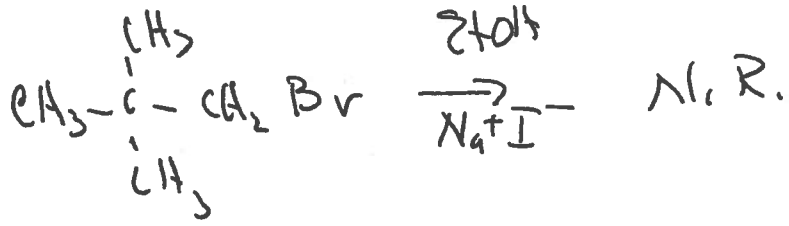
S_N2 blocked

c) 2-bromo-2-methylbutane in ethanol containing an excess of sodium iodide

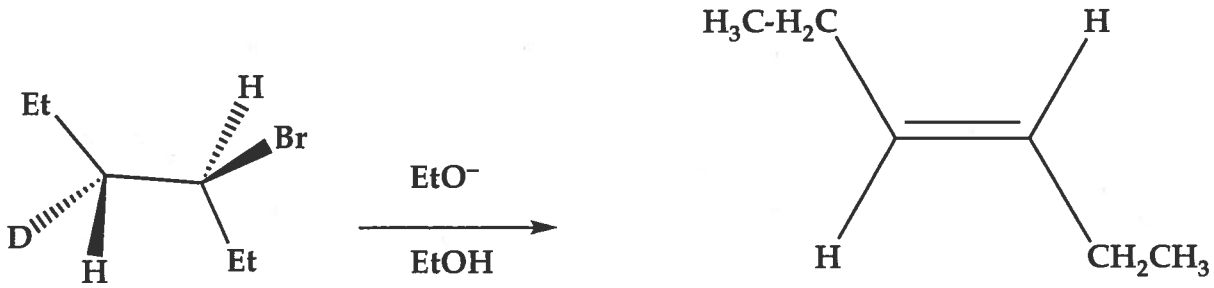


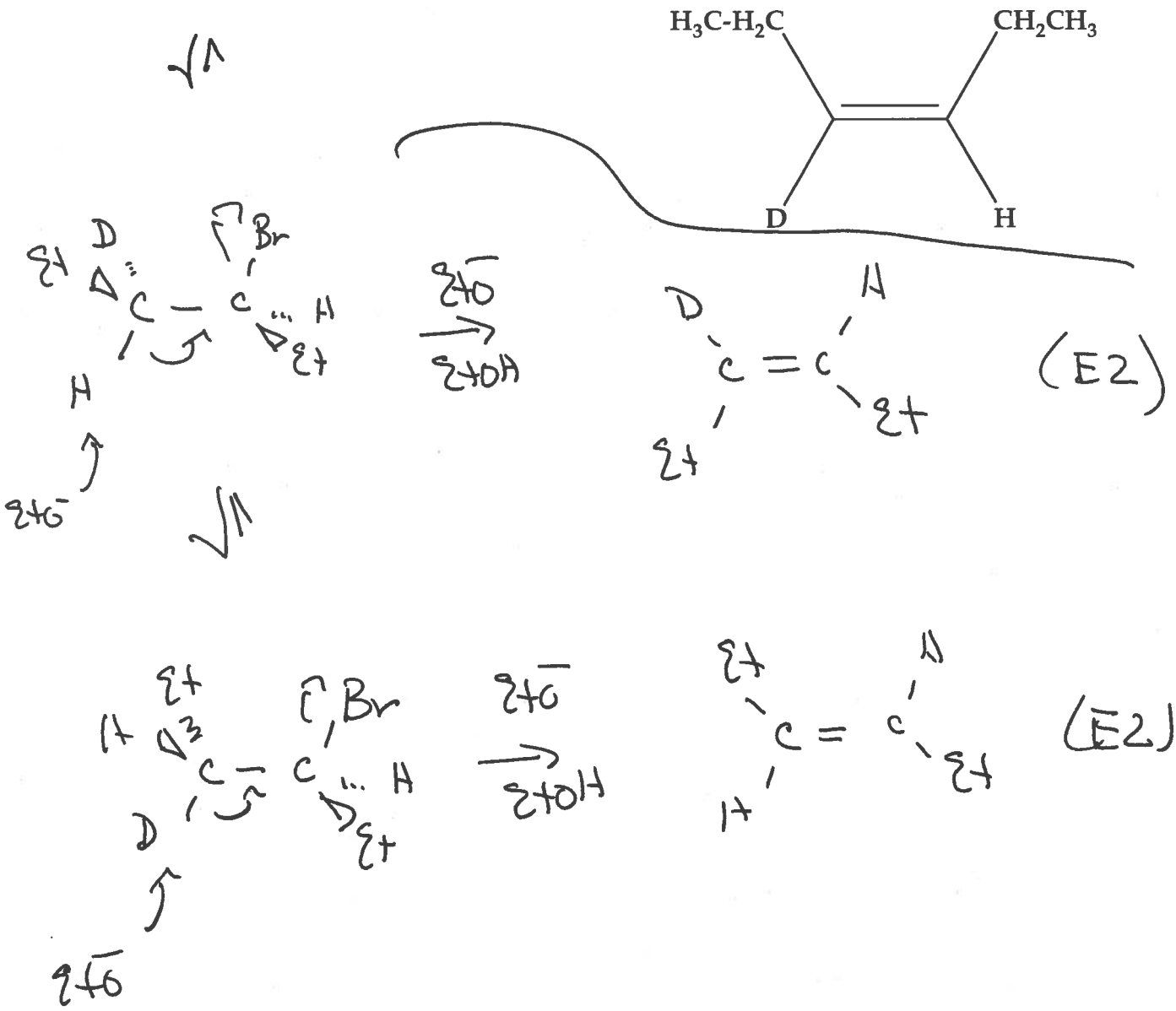


d) neopentyl bromide in ethanol containing an excess of sodium iodide



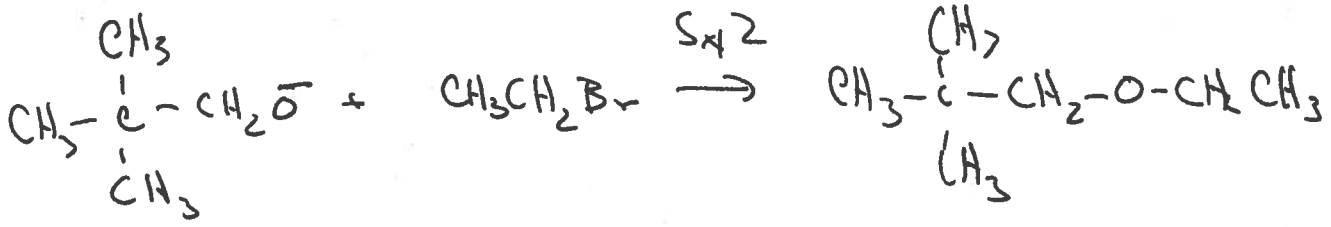
2. (10 pts) Why does the 2-bromobutane react with $CH_3CH_2O^-$ to give a mixture of 2-butene stereoisomers in which the Z isomer contains deuterium?



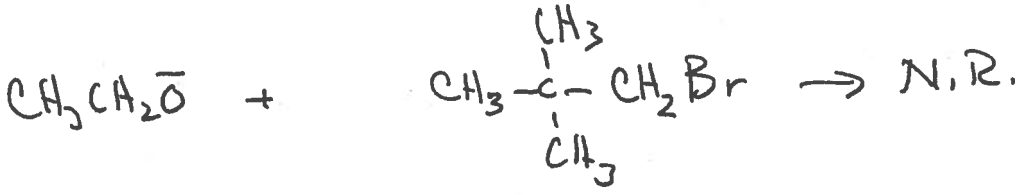


3. (10 pts) What is the product of the Williamson ether synthesis in a) ? Why does reaction b) fail?

a) $(CH_3)_3CCH_2O^- + CH_3CH_2Br \rightarrow$

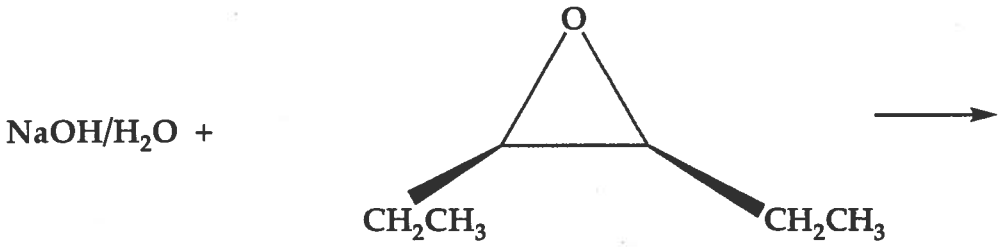


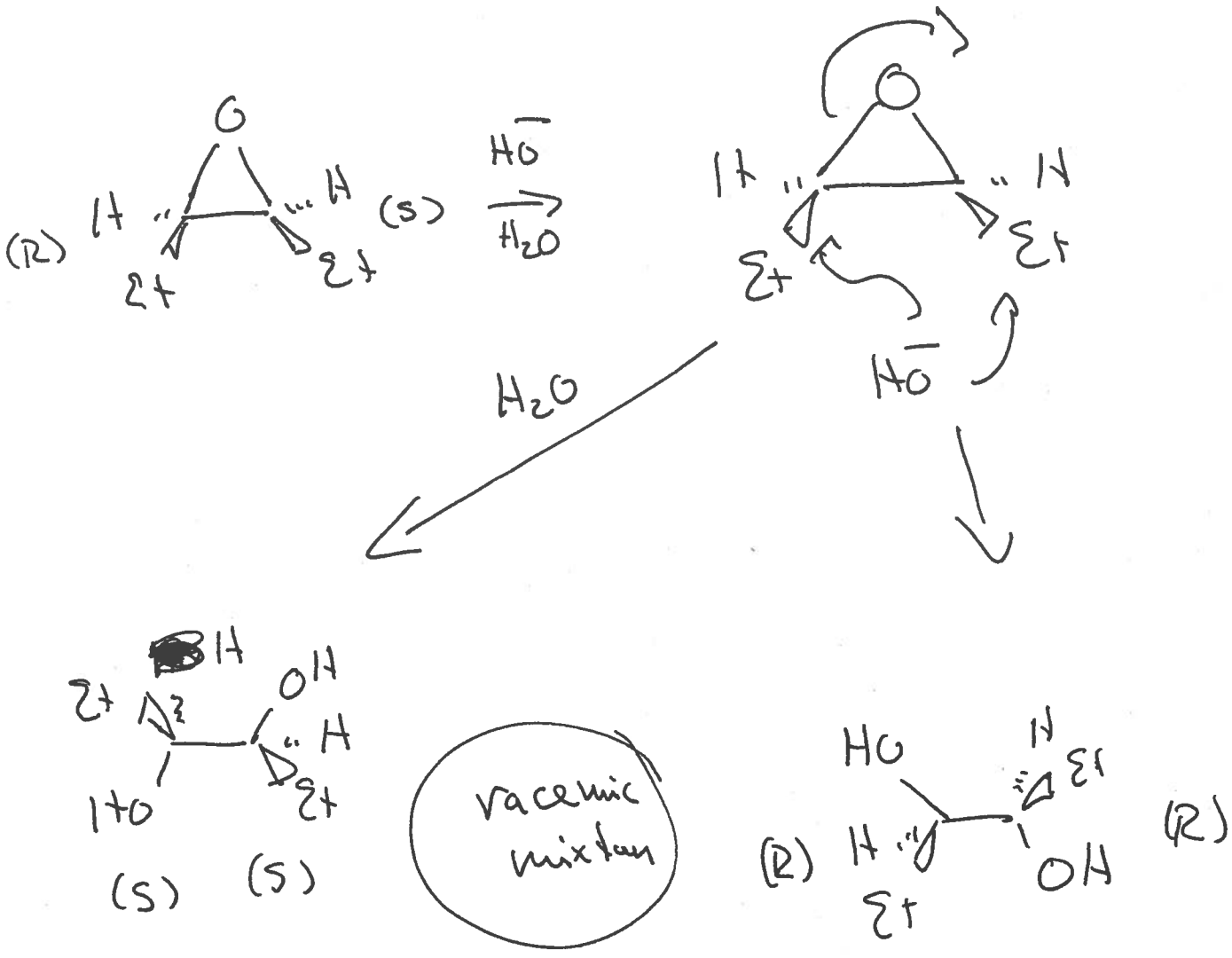
b) $EtO^- + (CH_3)_3CCH_2Br \rightarrow$



S_N2 is blocked by steric hindrance

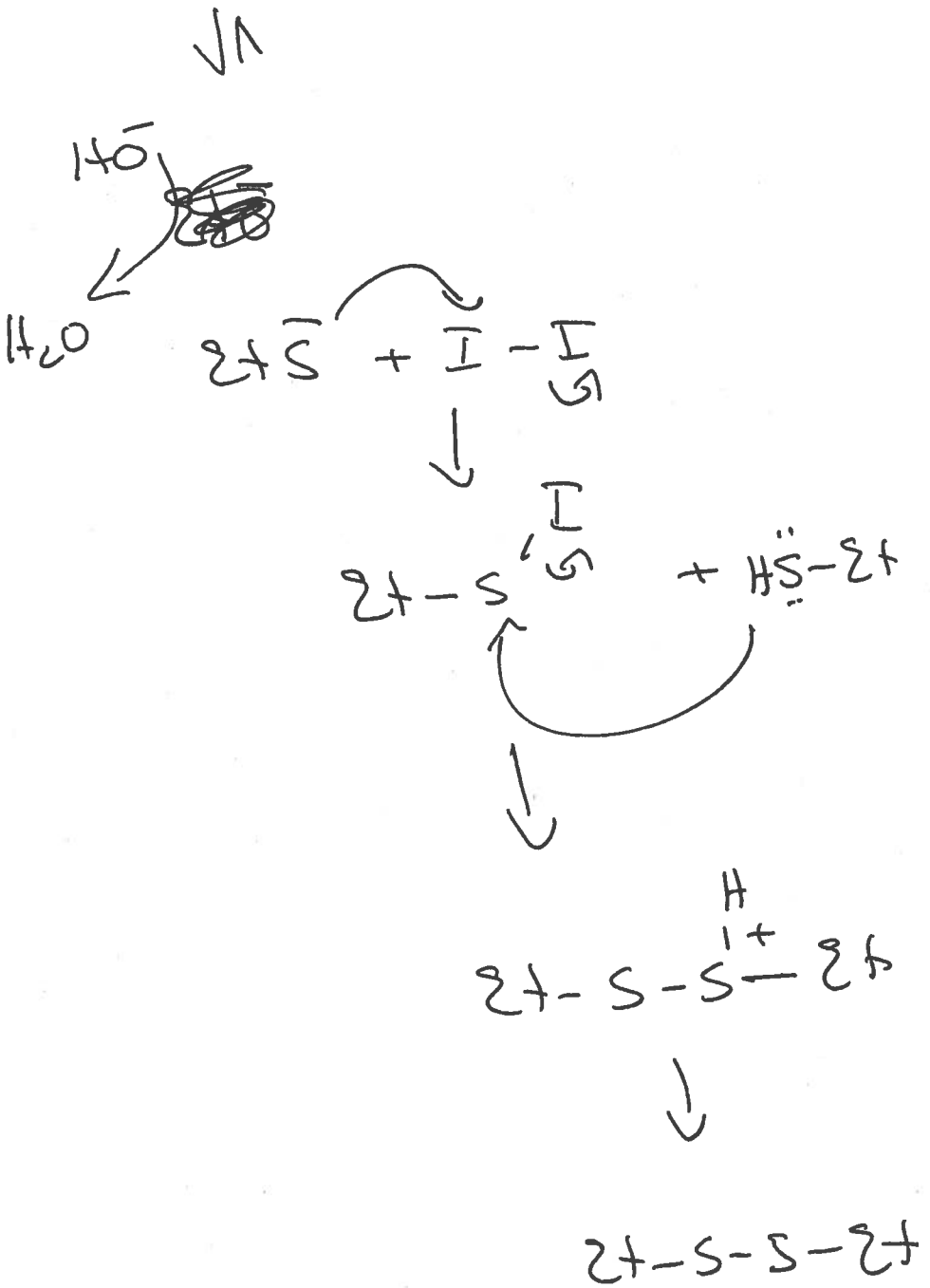
4. (10 pts) What is stereochemistry of the 3, 4-hexanediol formed when *meso* 2, 3 diethyloxirane reacts with aqueous sodium hydroxide?





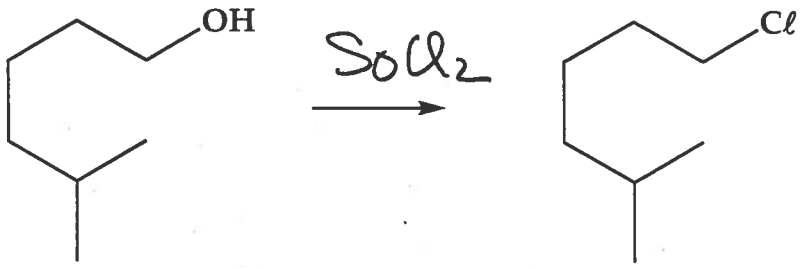
5. (10 pts) When ethane thiol is treated with base and I_2, a disulfide is formed. What is the mechanism?

$CH_3CH_2SH + NaOH/H_2O + I_2 \rightarrow CH_3CH_2S\text{-}SCH_2CH_3$



6. (10 pts) Suggest conditions for carrying out each of the following reactions.

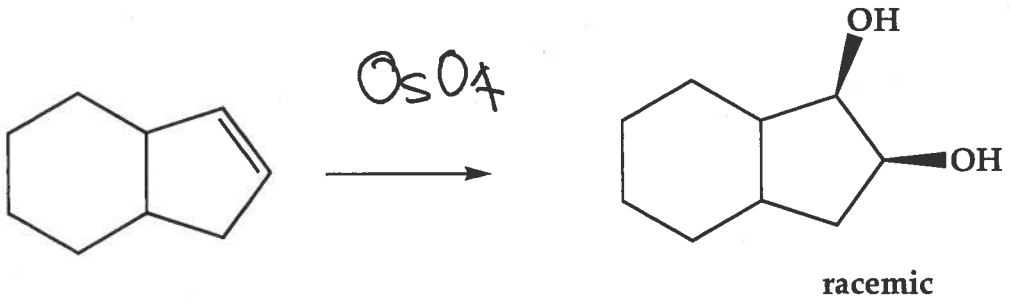
a)



b)

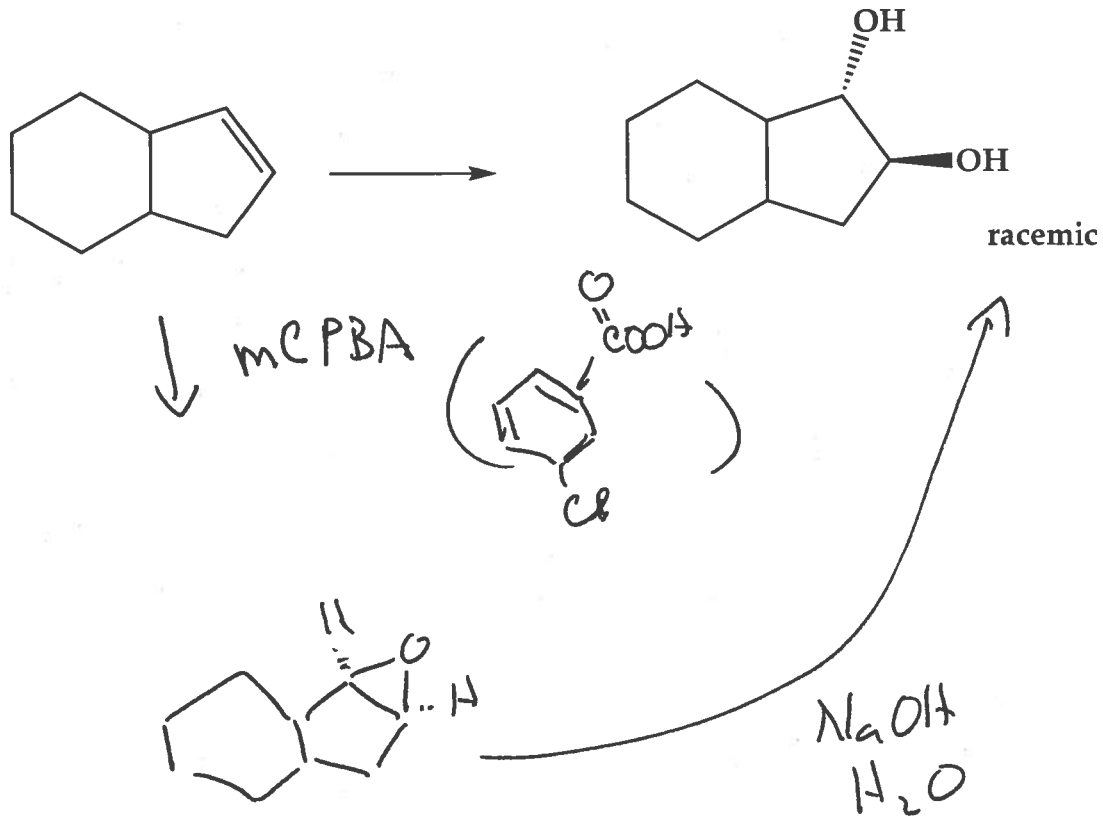
7. (10 pts) Carry out the following transformations:

a)



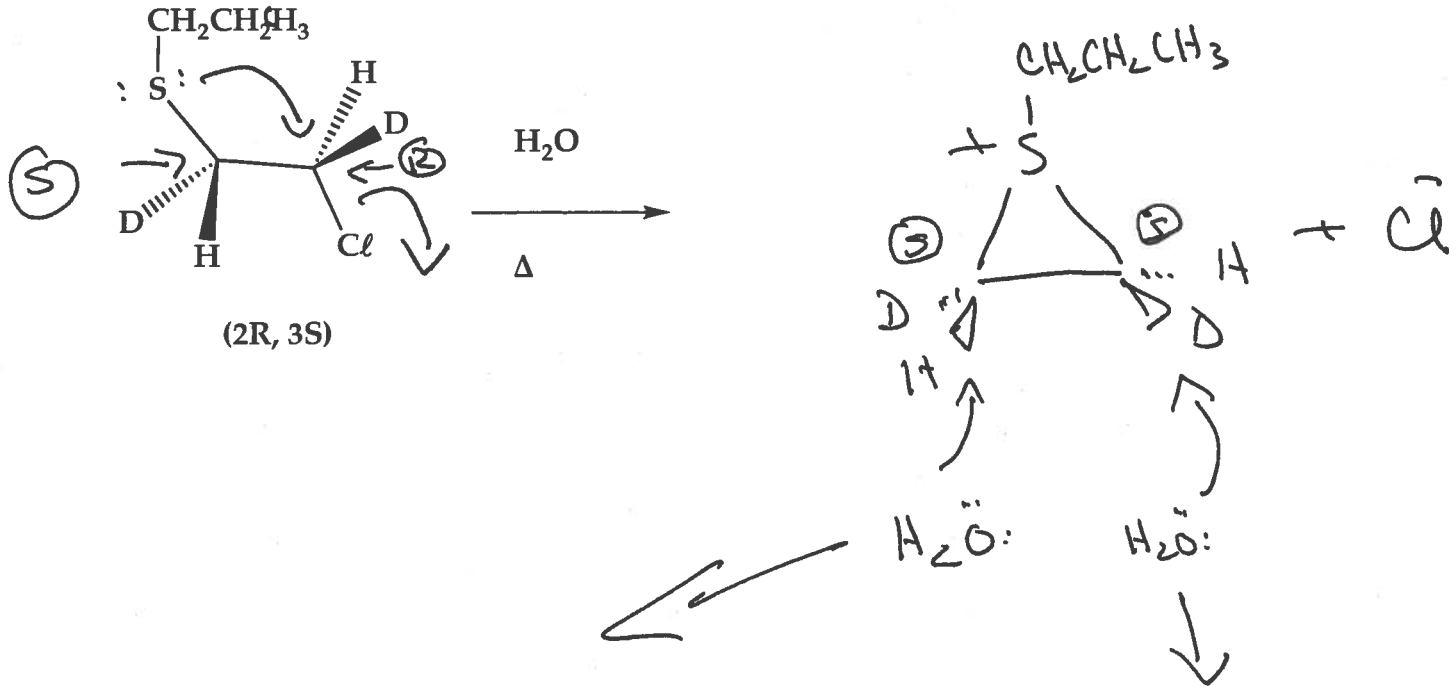
racemic

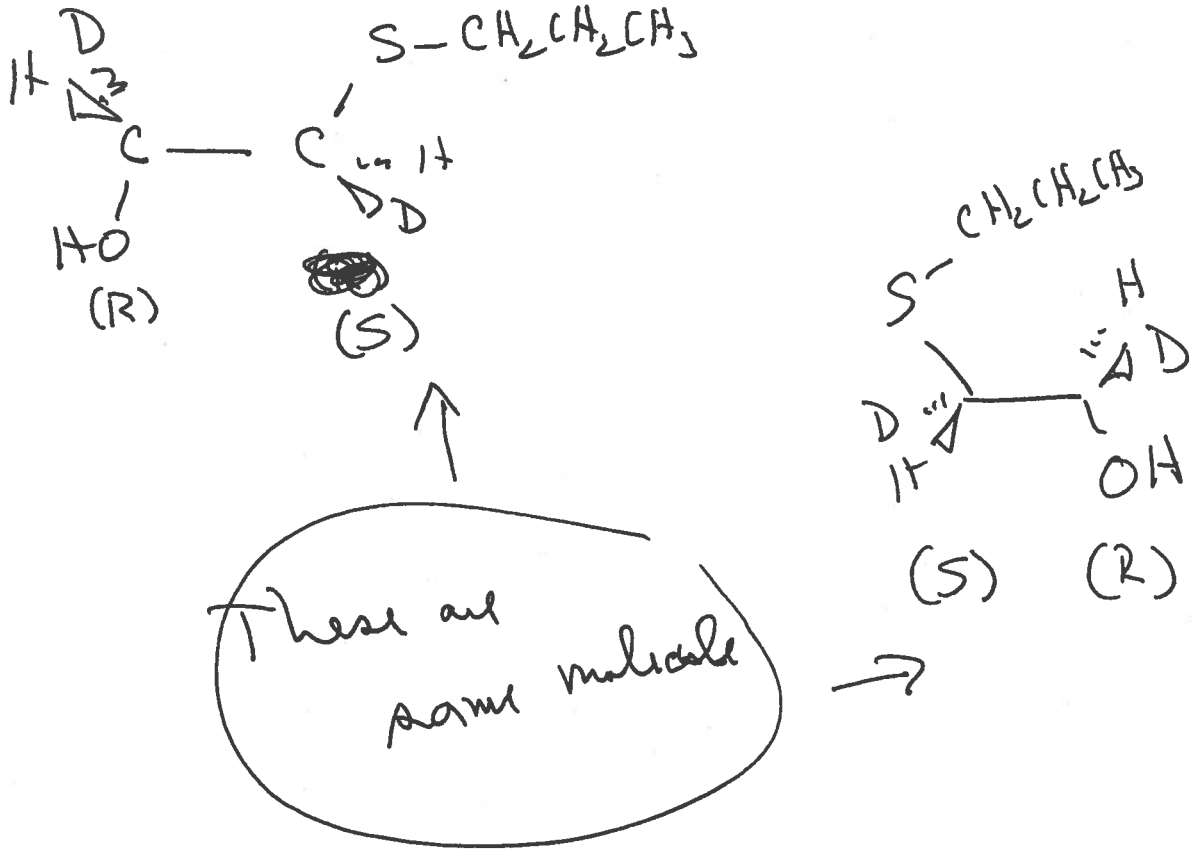
b)



racemic

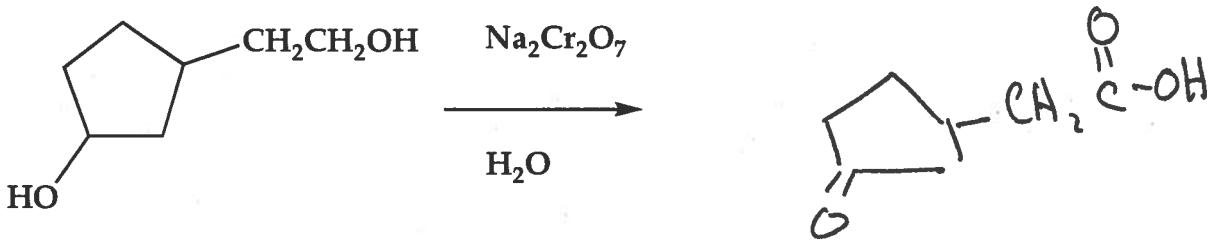
8. (10 pts) What is the product of the hydrolysis of the following chlorosulfide? Be explicit about the stereochemistry.





9. (10 pts) What is the product of the following oxidations?

a)



b)