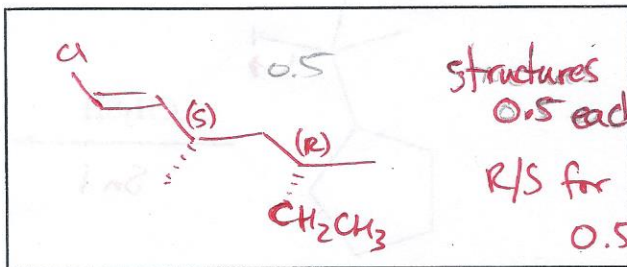
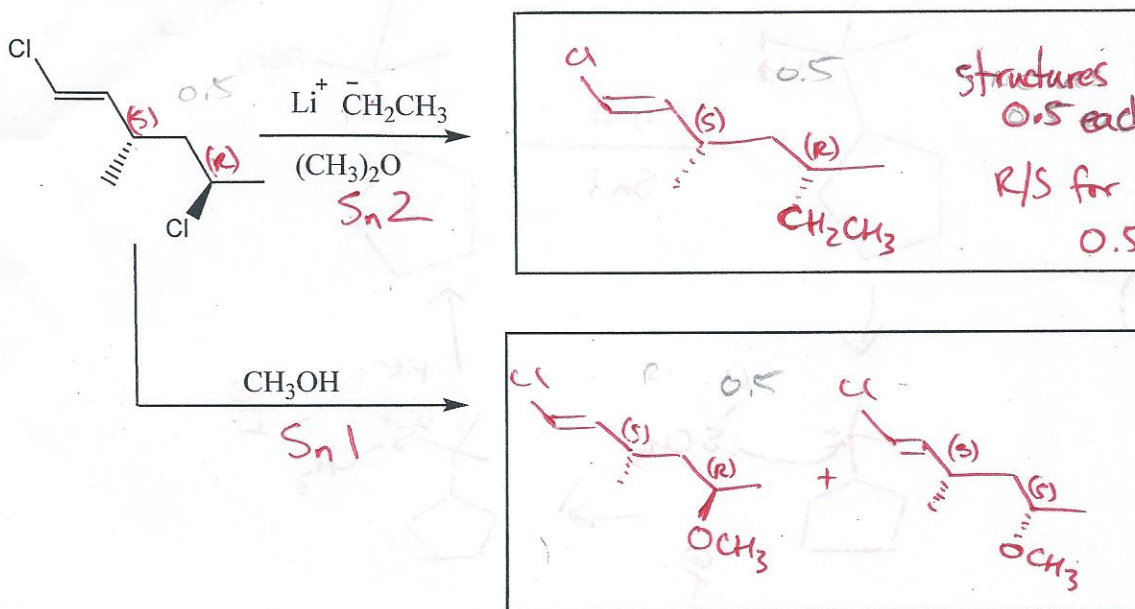
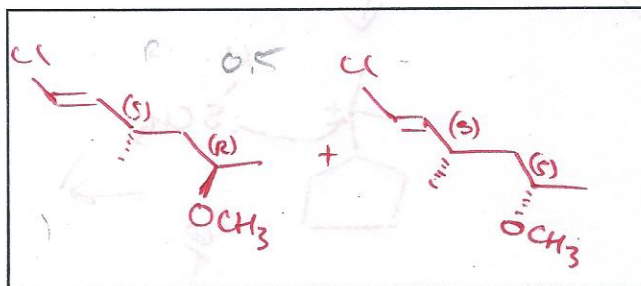


1. (a) Draw the substitution product(s), including stereochemistry, for the following reactions in the boxes provided. If no reaction will occur or the equilibrium is unfavorable, write NA.



Structures
0.5 each
R/S for S.M. and ppts
0.5 each box



4

- (b) Clearly label the stereocenters as R or S in starting materials and products.

- (c) Accidentally, a careless graduate student added three times as much solvent to each of the above reaction as he should have. The original reactions both would have been done in one hour but when should the student expect the reactions to be finished now?

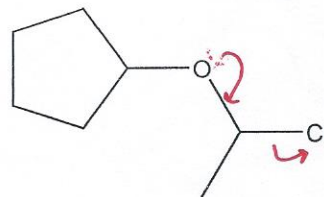
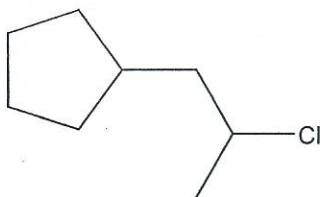
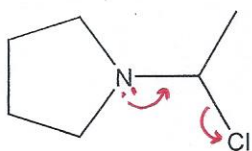
I gave 0.5 pts if you correctly labeled only 1 stereocenter per structure.

0.5 Top reaction 9 hours

0.5 Bottom reaction 3 hours

or 0.5 pts total if you said >1 hr for both.

2. Rank the compounds shown below in order of how quickly they will undergo substitution under SN1 conditions (1-3, 1 = fastest.) Provide a 1-2 sentence explanation for your answer.



3

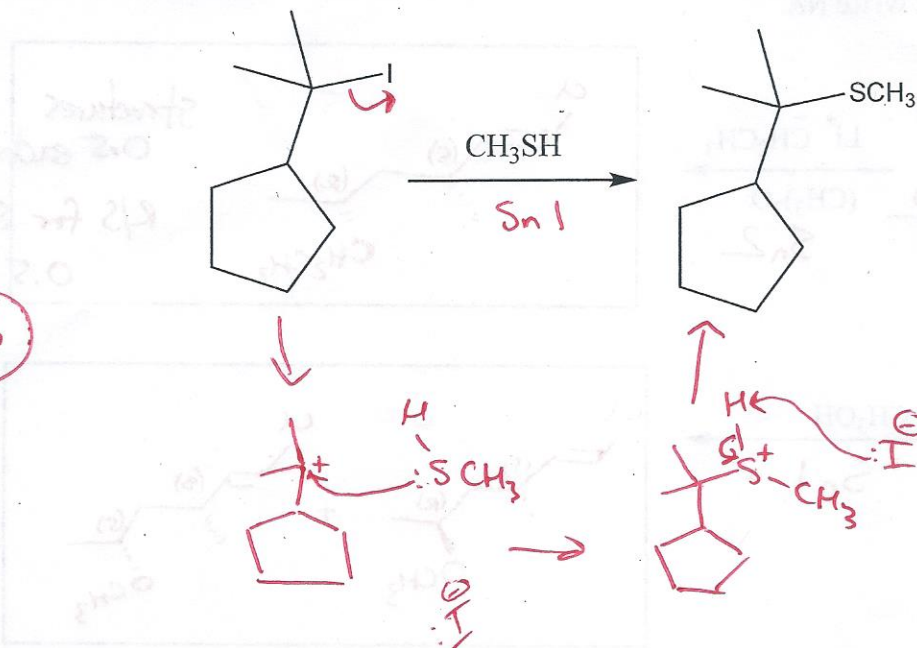
1 pt for ranking

2 pt explain

Best resonance stabilization of the carbocation.

* If you explain that the first and third structure are 1°, I will accept that, and the ranking that goes with it.

3. Using proper curved arrows, draw the mechanism for the following reaction:



3

14

0.5 for each intermediate
 2 for correct arrows
 (0.5 for each arrow)

No points for S_N2 mechanism.



5

3

1

10

Best resonance stabilization of the carbocation
 * If you explain that the first and third structures are
 1° I will accept that, and the ranking that goes
 with it.