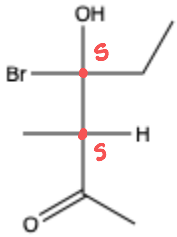
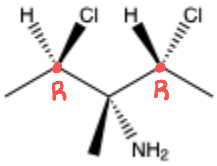
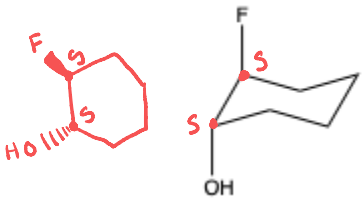
CHEM 2300 Solution 7

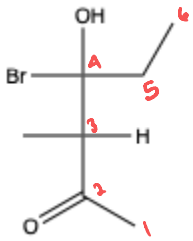
1. Label every stereocenter and give the absolute configuration.

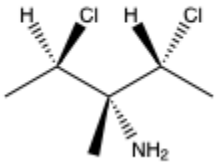


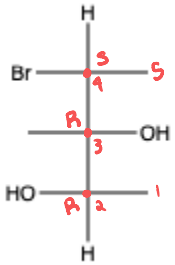


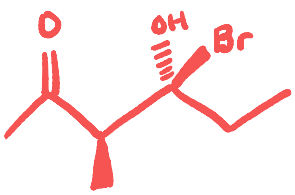


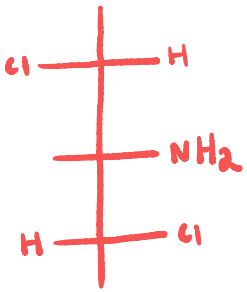
2. Draw the Fischer Projection into wedge-dash or the other way around.

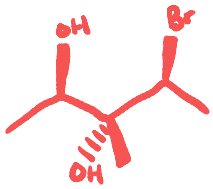












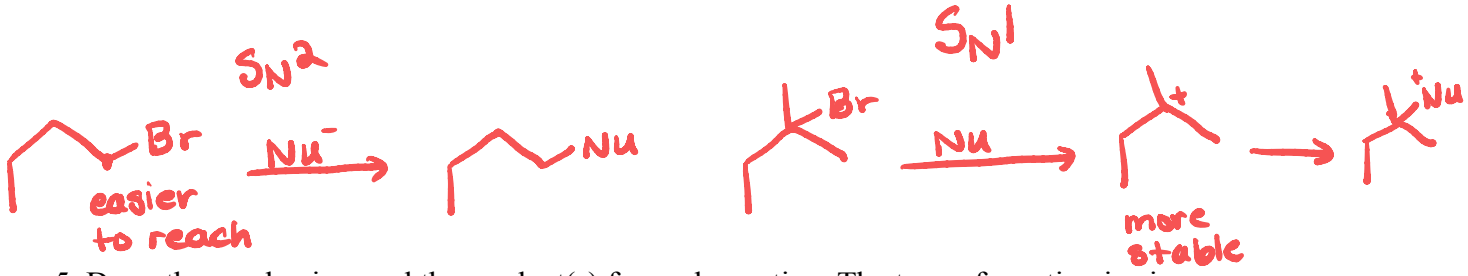
3. Why do you get only one product for S_N2 and two products for S_N1? Use the intermediate.

Because in S_N2 the leaving group leaves at the same time as Nu, only attacking on one side. S_N1 however, the leaving group leaves and then the Nu attacks, allowing it to attack on either side. ↳ carbocation, stereochem lost

4. Why do primary carbons prefer S_N2 while tertiary carbons prefer S_N1? Use the intermediate.

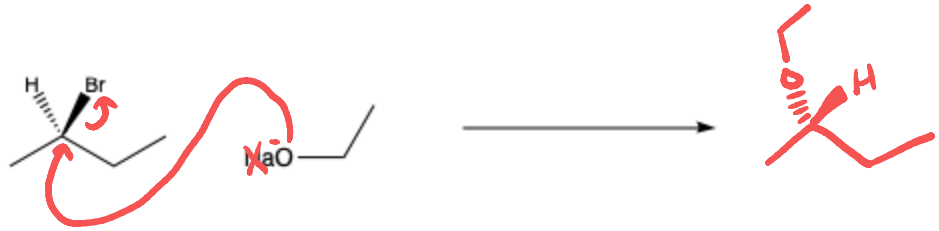
S_N1 have a carbocation intermediate which is more stable on 3° C.

S_N2 doesn't do this so it wants an easier attack which occurs on 1° C.

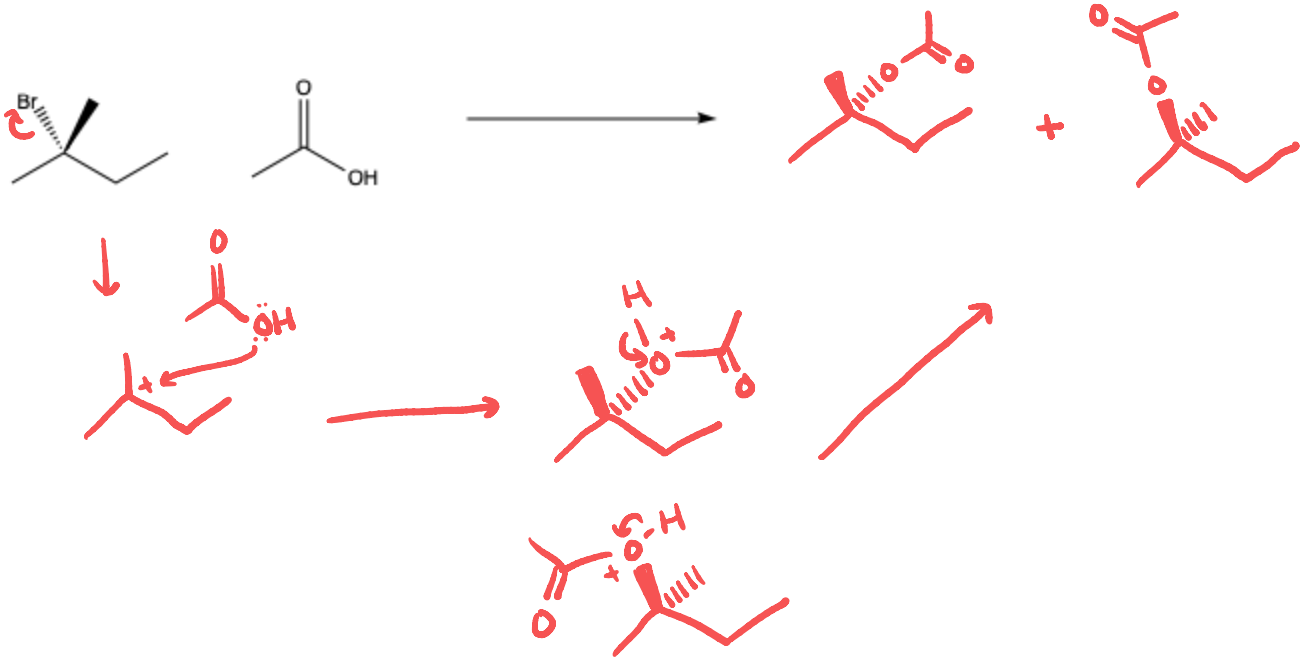


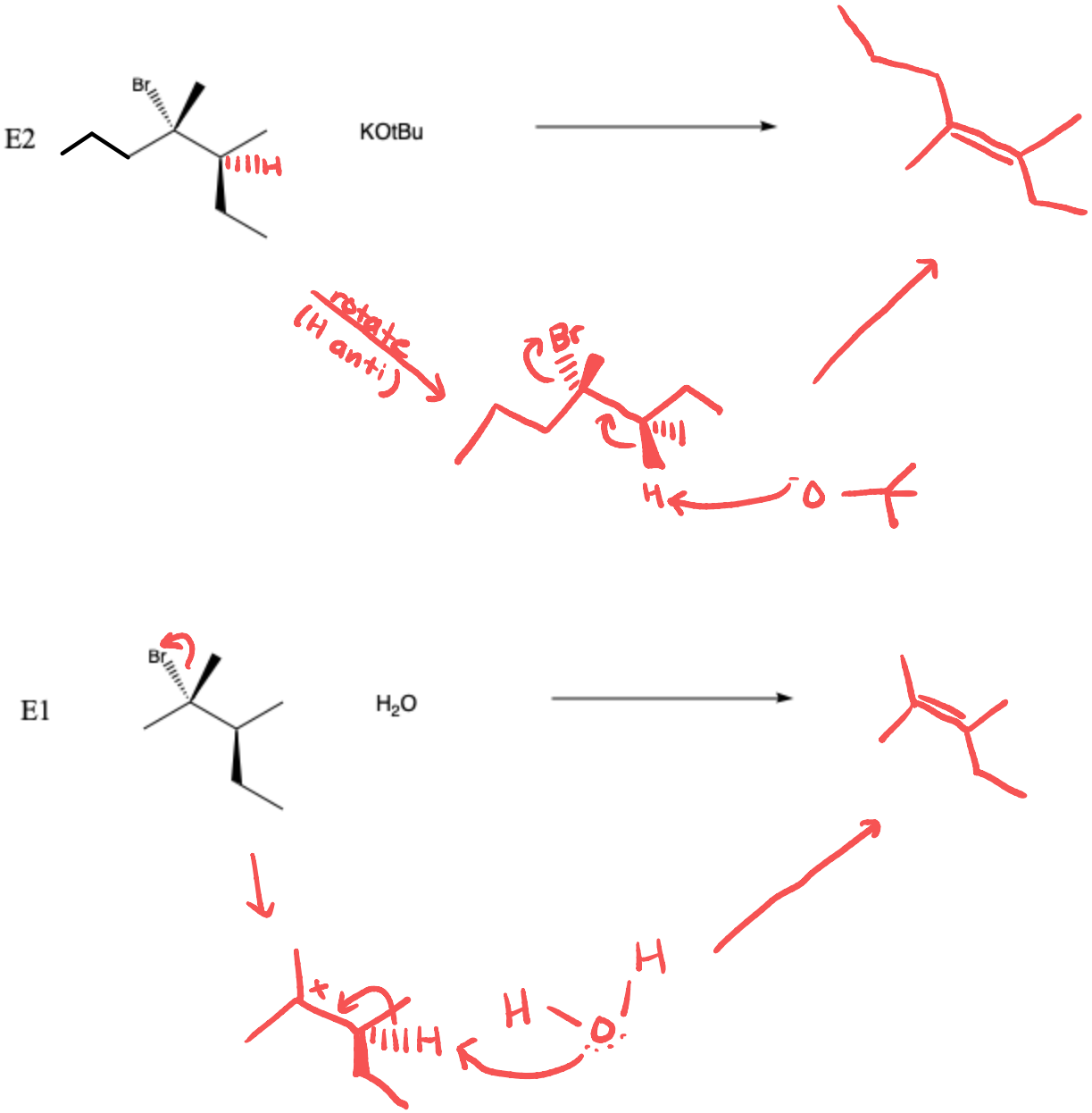
5. Draw the mechanism and the product(s) for each reaction. The type of reaction is given.

S_N2



S_N1



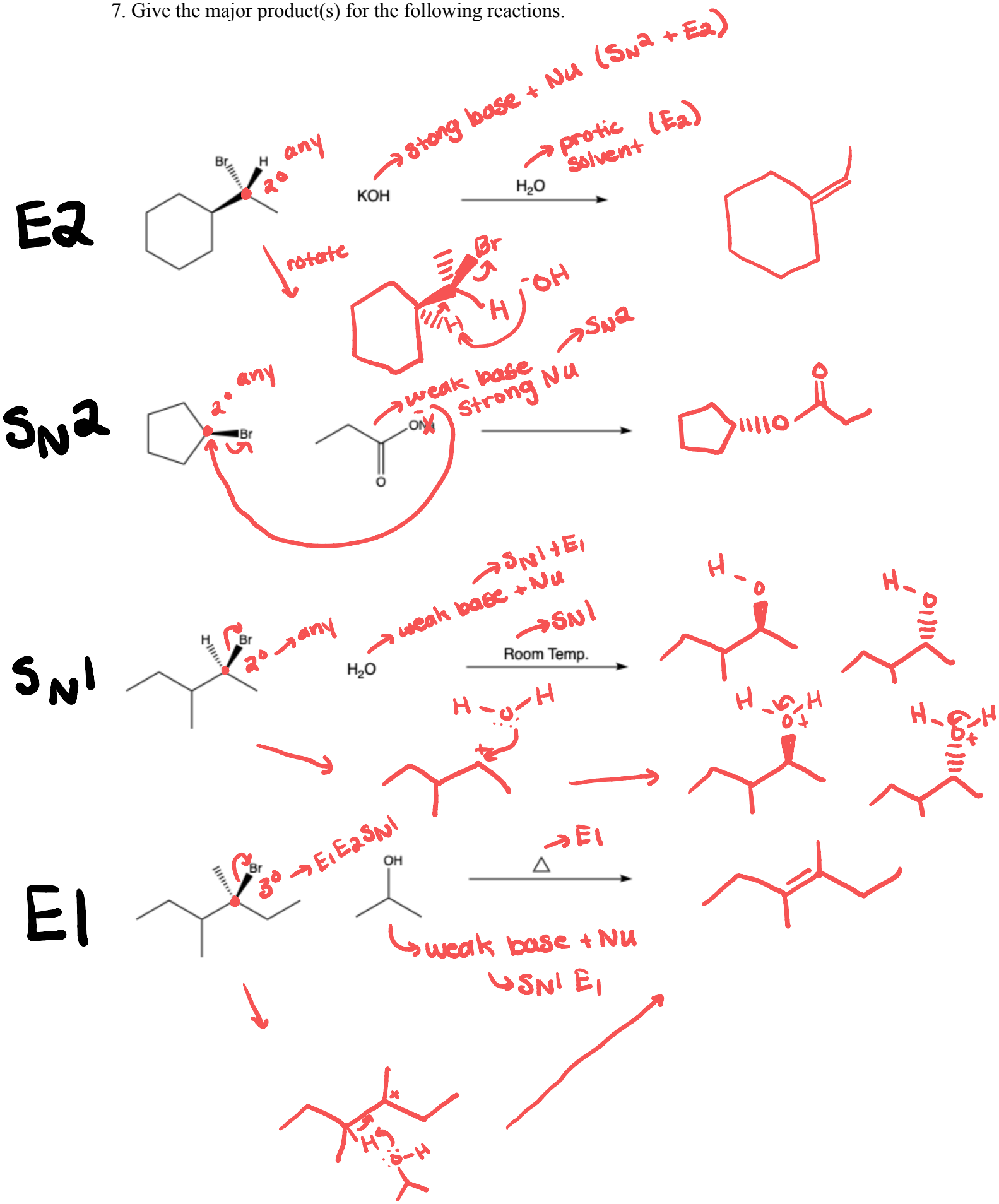


6. Why do we want a strong nucleophile/base for S_N2 and E2 but don't need that for S_N1 and E1 but we need a good leaving group for those?

→ needs to be strong to do this

For S_N2 and E2 the Nu is what initiates the rxn which then kicks off the L. But in S_N1 and E1 the L group leaves which leaves a (+) so any Nu will attack. But this means we need a good L.

7. Give the major product(s) for the following reactions.



8. Synthesis the following molecule starting with a three carbon alkene.