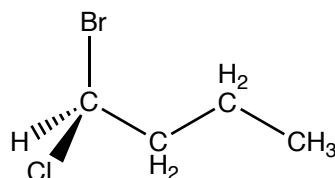
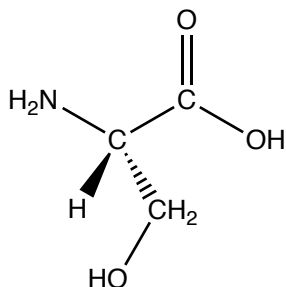
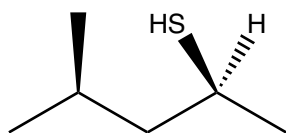


1. (12 pts.) Using the rules for determining the configuration of a chirality center assign priorities to the groups or atoms bonded directly to the chirality centers in the following structures.



2. (2 pts. ea.) Mark the following as true or false.

\_\_\_\_\_ Diastereomers typically have the same melting points.

\_\_\_\_\_ A molecule must be chiral to have an enantiomer.

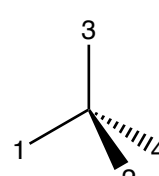
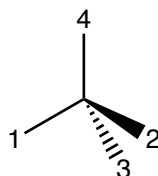
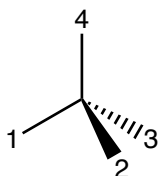
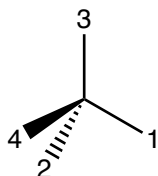
\_\_\_\_\_ A molecule must be chiral to have a stereoisomer.

\_\_\_\_\_ To be chiral a molecule must not contain a mirror plane/plane of symmetry.

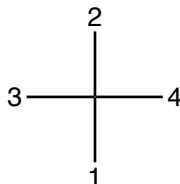
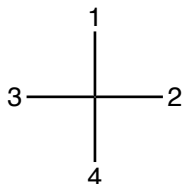
\_\_\_\_\_ Diastereomers are stereoisomers that are not mirror images of each other.

\_\_\_\_\_ In a Fischer projection, the vertical bonds are assumed to point away from the viewer.

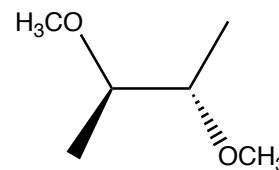
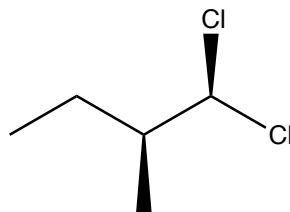
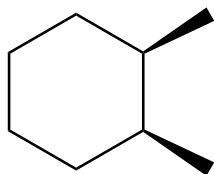
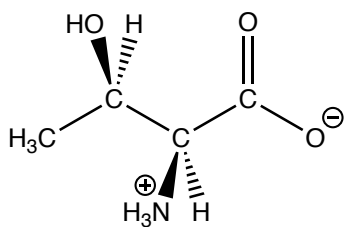
3. (8 pts) Determine the configurations of the chirality centers drawn below. Priorities have been assigned to the groups, which are not shown.



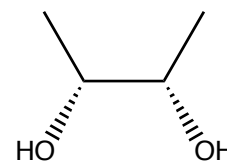
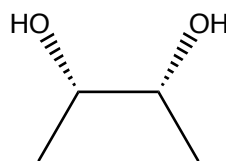
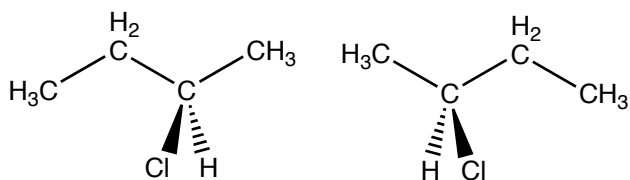
4. (4 pts.) Determine the configurations of the chirality centers on the Fischer projections drawn below. Priorities have been assigned to the groups, which are not shown.



5. (a. 8 pts.) Place a star next to the chirality centers on the following molecules, and (b. 8 pts.) circle the chiral molecules.



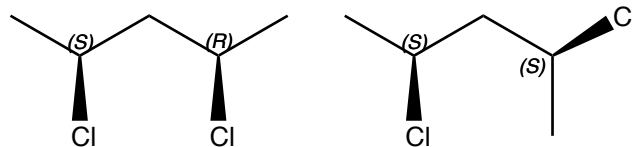
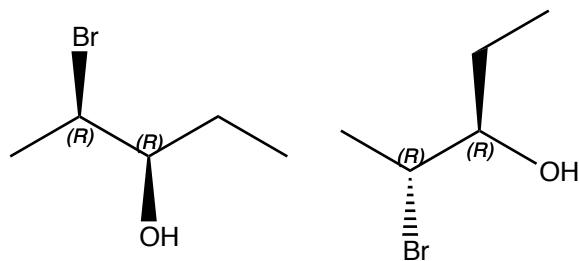
6. (12 pts.) Determine whether the following pairs of structures are enantiomers, diastereomers, or different views/rotamers of the same molecule.




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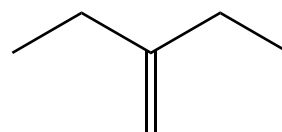
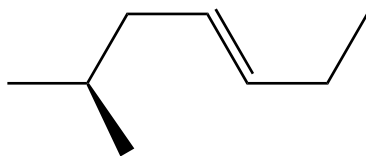



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7. (a. 12 pts.) Provide IUPAC names for the following structures, and (b. 6 pts.) include Z or E designations where appropriate.



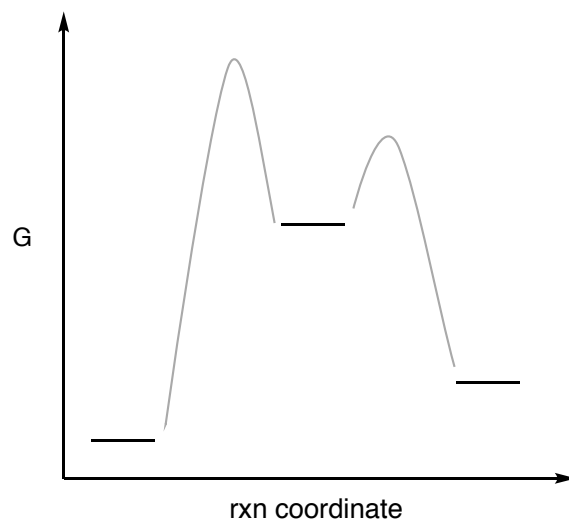

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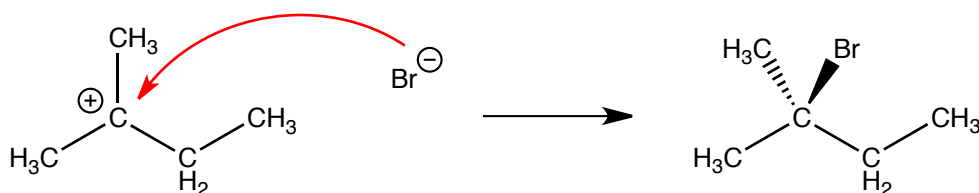
8. (2 pts. ea.) The questions below refer to the reaction coordinate diagram draw to the right.

- Label the reactant(s) with an "a".
- Label the product(s) with a "b".
- Label the intermediate(s) with a "c".
- Label the transition state(s) with a "d".
- Does this reaction absorb or release energy?
- Would this reaction have a positive or negative  $\Delta G$ ?
- Does the equilibrium favor the reactants or products.
- How many steps would the mechanism of this reaction have?

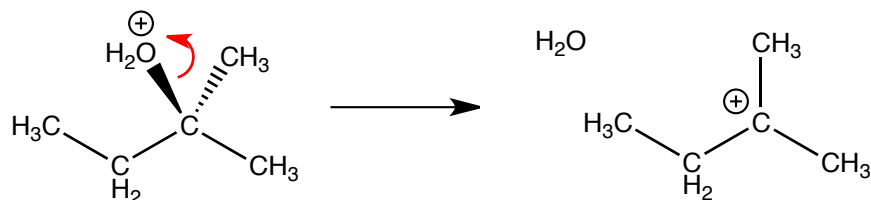


9. (12 pts.) Explain what the electron movement arrows in the following reaction steps mean.

a.

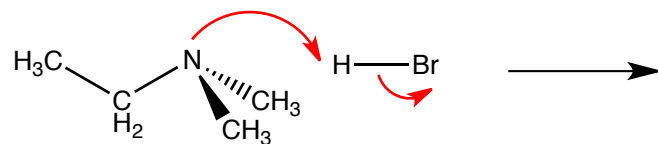


b.



10. (12 pts.) Draw the products that would form based on the electron movement arrows drawn below.

a.



b.

