

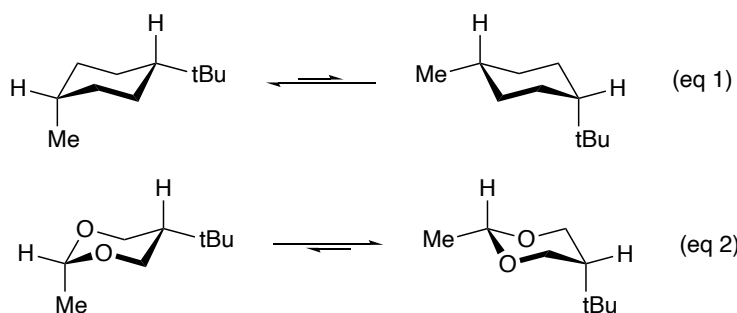
### Quiz 3: Stereochemistry

total score: 24 pts

1. Using Newman projections, draw all of the staggered and eclipsed conformers [six in total] of 2,3-dimethylpentane with respect to rotation about the C2-C3 bond. Then, indicate the conformation with the highest energy and the conformation with the lowest energy. (Hint: when drawing Newman projections, you should let the front carbon be fixed!)

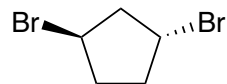
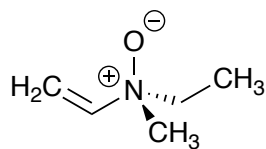
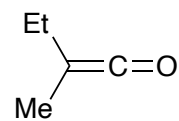
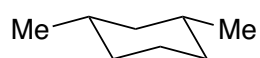
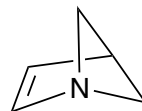
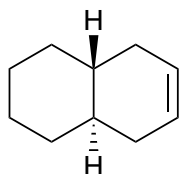
(8 pts)

2. *cis*-1-*tert*-butyl-4-methylcyclohexane prefers the conformation in which the *tert*-butyl group is equatorial (eq 1). A related molecule, *cis*-5-*tert*-butyl-2-methyl-1,3-dioxane, however, prefers to put the *tert*-butyl group axial (eq 2). Explain this apparent contradiction.



(4 pts)

3. Answer the following questions:
- Label each molecule as **chiral** or **achiral**.
  - Label each stereocenter with its **R** or **S** configuration.
  - Label all of the **meso** compounds.



(12 pts)