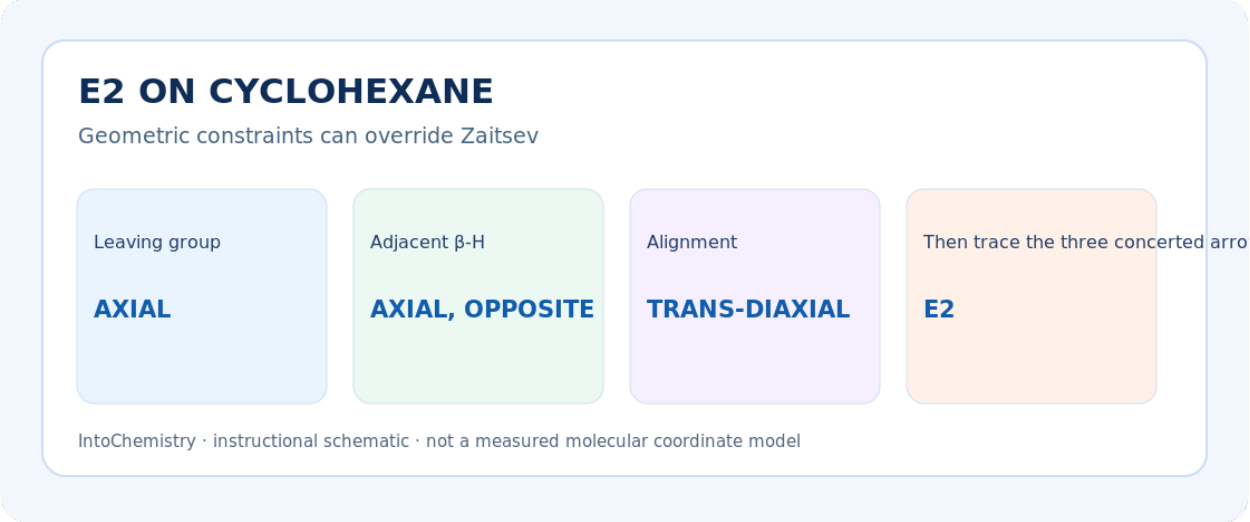
Cyclohexane E2: Trans-Diaxial Requirement — Practice Worksheet

Name: _____ **Date:** _____

Skills: Identify chairs that expose an axial leaving group and an adjacent anti axial beta hydrogen.



Directions: Answer every question. Include a quick labeled sketch or your reasoning when asked. Show chair positions and up/down directions separately.

1. In a substituted cyclohexane, the leaving group at C1 points up in chair A. Assume an adjacent carbon carries an appropriately oriented axial β-H if the leaving group is axial, with no other substituents preventing that H. Can this drawn chair directly provide the preferred trans-diaxial E2 arrangement?

2. In a substituted cyclohexane, the leaving group at C1 points up in chair B. Assume an adjacent carbon carries an appropriately oriented axial β-H if the leaving group is axial, with no other substituents preventing that H. Can this drawn chair directly provide the preferred trans-diaxial E2 arrangement?

3. In a substituted cyclohexane, the leaving group at C2 points down in chair A. Assume an adjacent carbon carries an appropriately oriented axial β-H if the leaving group is axial, with no other substituents preventing that H. Can this drawn chair directly provide the preferred trans-diaxial E2 arrangement?

4. In a substituted cyclohexane, the leaving group at C2 points down in chair B. Assume an adjacent carbon carries an appropriately oriented axial β-H if the leaving group is axial, with no other substituents preventing that H. Can this drawn chair directly provide the preferred trans-diaxial E2 arrangement?

5. In a substituted cyclohexane, the leaving group at C4 points up in chair A. Assume an adjacent carbon carries an appropriately oriented axial β-H if the leaving group is axial, with no other substituents preventing that H. Can this drawn chair directly provide the preferred trans-diaxial E2 arrangement?

6. Why can an equatorial leaving group not perform the preferred chair E2 directly?

7. What if the adjacent carbon has no axial β-hydrogen?

8. Which constraint may override Zaitsev selectivity on a cyclohexane?