Lecture "Modern Synthetic Methods"
Take-home messages from Week 3

2.1.4. Cyclic Stereocontrol

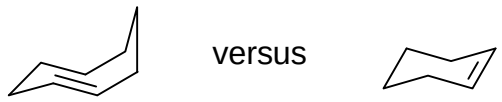
Cyclopropanes/Cyclobutanes: - rigid, well defined upper and lower ring side

Cyclopentanes: - more flexible, sometimes surprises in prediction

Cyclohexanes: - well defined, prediction possible according to A-values, Fürst-Plattner-Rule, etc.

Cycloheptane: - flexible, typically difficult to predict conformation

Cyclooctanes: - boat-chair conformation, pseudo-A-values, in all larger rings double bonds have an inner and an outer side (perpendicular to ring plane)



boat-chair

2.2. Diastereoselective additions to carbonyl compounds

Felkin-Anh-Model: - allows to predict which side of acyclic carbonyl groups is attacked if a stereocenter is present in neighbouring position

Houk's rule: - "The tendency for staggering of vicinal bonds is higher for partially formed bonds than for fully formed bonds." → R_L perpendicular to carbonyl group

Bürgi-Dunitz study: - Nucleophiles attack carbonyl groups along a specific path, the bürgi-Dunitz trajectory in an angle of 107°.