Course 343 Lecturer Hackenberger
Day Wed. Date 10/23/13
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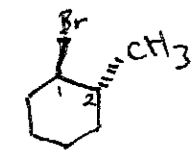
Last lecture

- cyclo alkanes → tortional + angle strain
- Chair conformation in cyclo hexane (preferred)
- axial vs. equatorial substituents → 1,3 Diaxial interactions
- ring flip

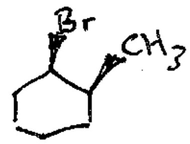
Additional office hour Friday Oct 25th after class ~ till 1:30

Exam covers everything up to the end of Ch. 7 (not CH. 8)



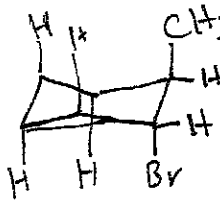
trans

vs



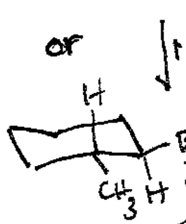
cis

Draw all conformations
- trans/cis also used for 1,3 + 1,4 cases
- as well as other cyclo structures



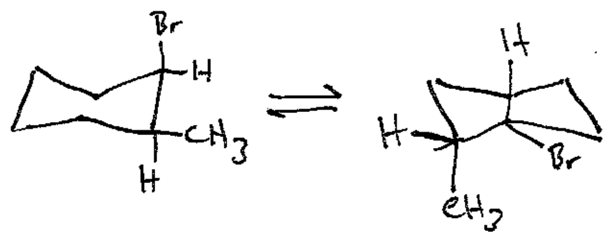
diaxial

or



diequatorial

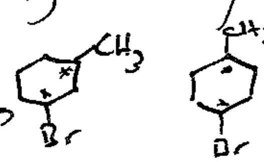
more energetically favorable



Br and CH_3 similar in size no preference

(But would change depending on size of substituent tBu vs. Me) (tBu would want to be equatorial)

trans compound here is lower in energy overall.
Look at 1,3 + 1,4 isomers and analyze cis vs. trans.



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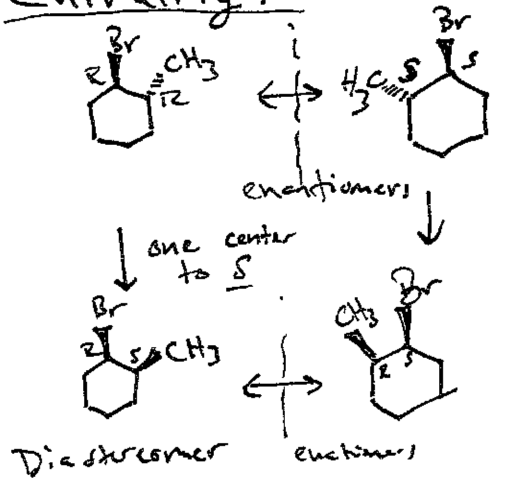
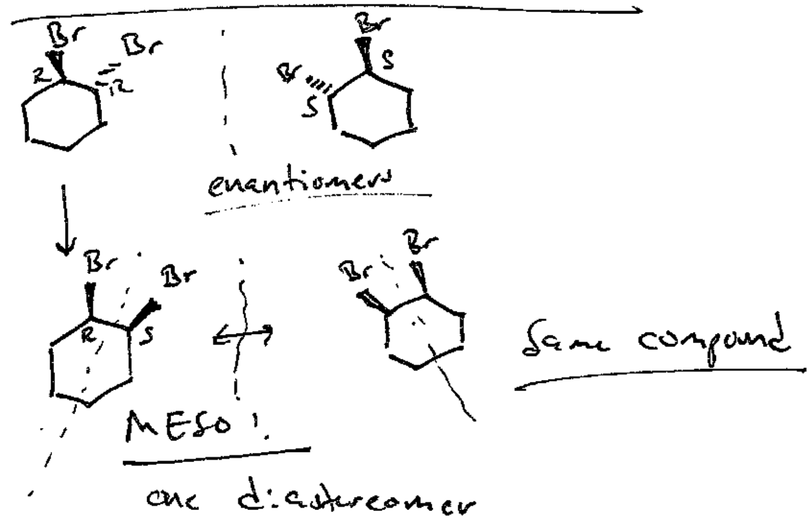
Chirality:

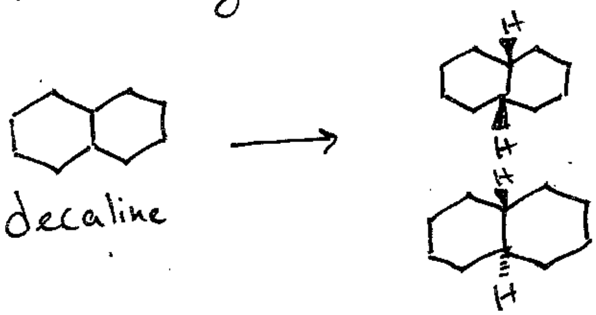


When Both substituents are the same



Molecules w/ ≥ 2 rings

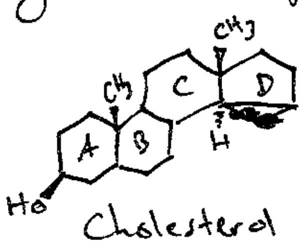
A) "Fused rings" share a common bond



cis - decaline

trans - decaline

Biological example: steroids



3 cyclo hexanes
1 cyclo pentane

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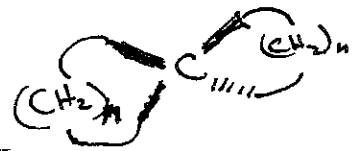
B.) Bridged bicyclic

~~norbornane~~
norborane

c) spiro compound
2 rings share only <u>one</u> carbon



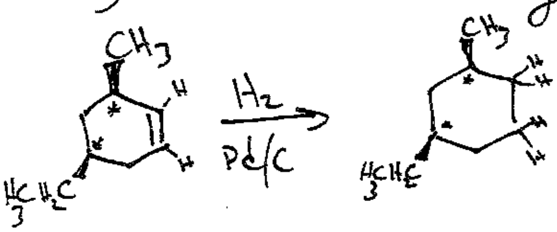
spiro cyclobutane

spiro cyclopentane

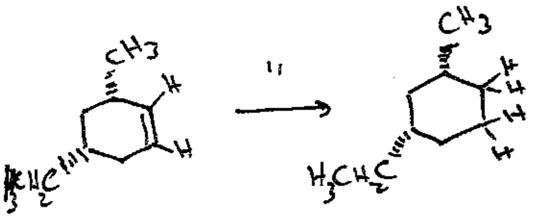
Ⓑ Relative reactivity of Stereo isomers

Different senarios w/ reactions

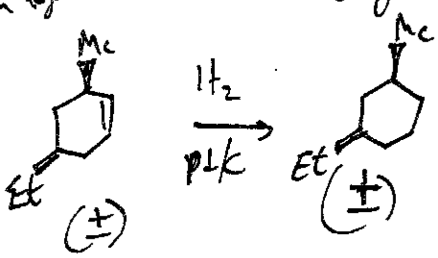
1a) Enantiomeric starting material reacts w/ an achiral reagent



Both reactions have the <u>same</u> reaction rate (k_{rel})



Both together same as saying:



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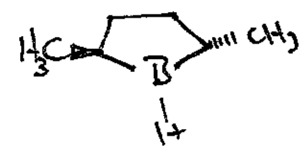
1.b) enantiomeric starting materials with ~~different~~ chiral reagent as chiral catalyst

text pg. 248

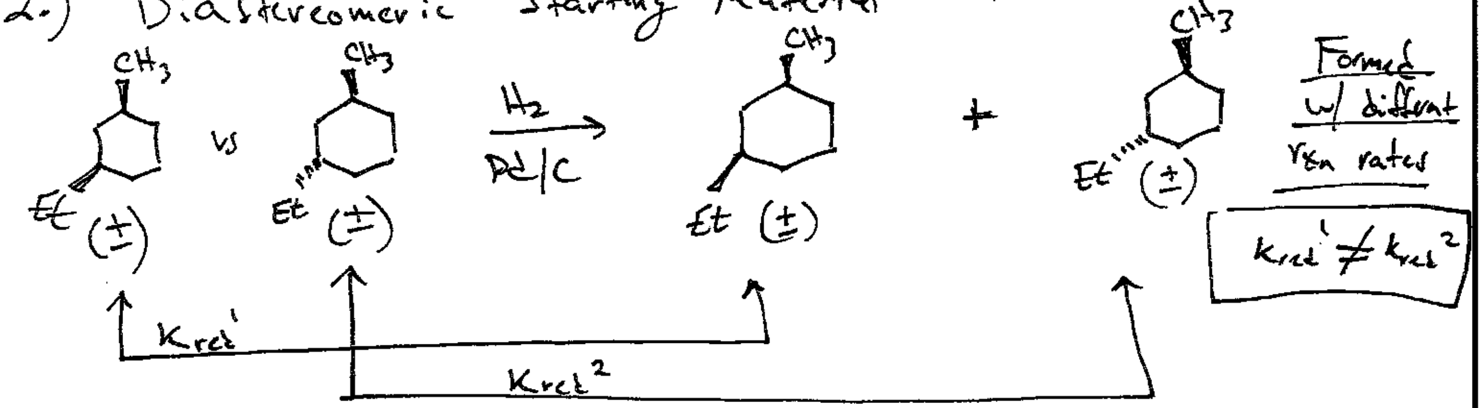
Chiral reagent



chiral ligand on Boran

will result in different rates for each enantiomer due to preference of chiral reagent

2.) Diastereomeric Starting Material



K_{red} = rate of reduction

Can not say which is faster, yet. Can only make a relative assignment + say they have different rates.

Rationale

enantiomeric SM + achiral reagent	enantiomeric SM + chiral reagent	diastereomeric (SM) + achiral reagent
1a (Enantiomeric T.S. → same energy)	1b (Diastereomeric T.S)	2 (Diastereomeric T.S) → diff energy

rxn rate determined by Transition state (T.S)

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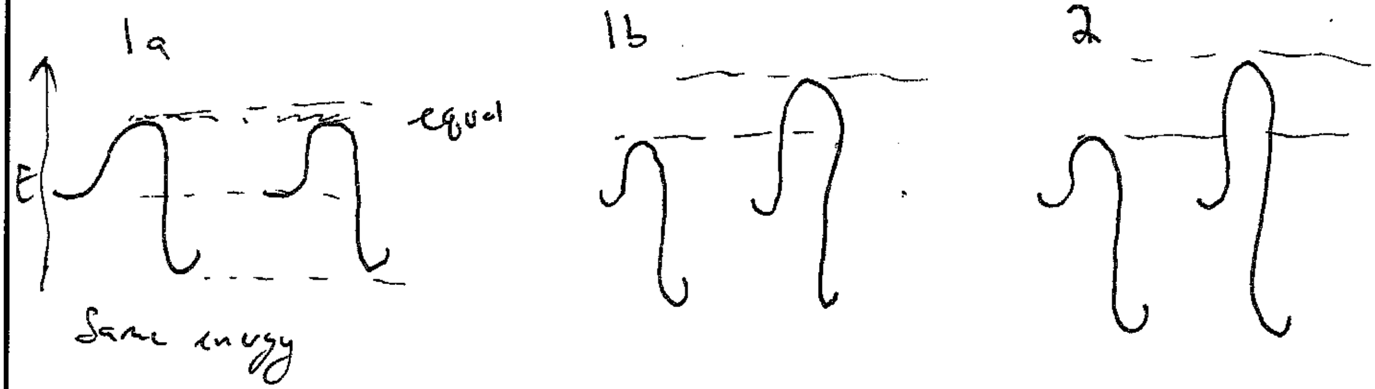

Different Diastereomeric T.S. Have different energies