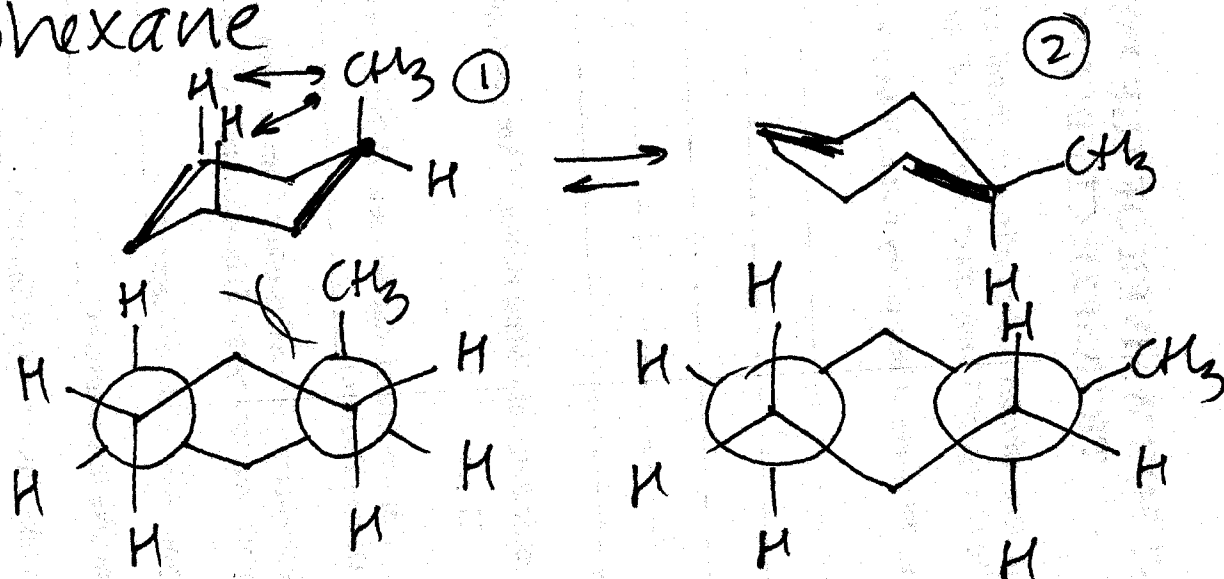
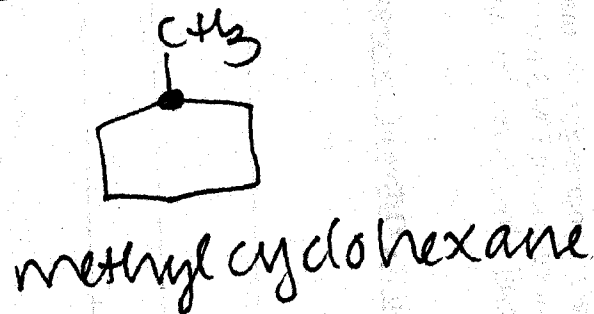


Substituted Cyclohexane

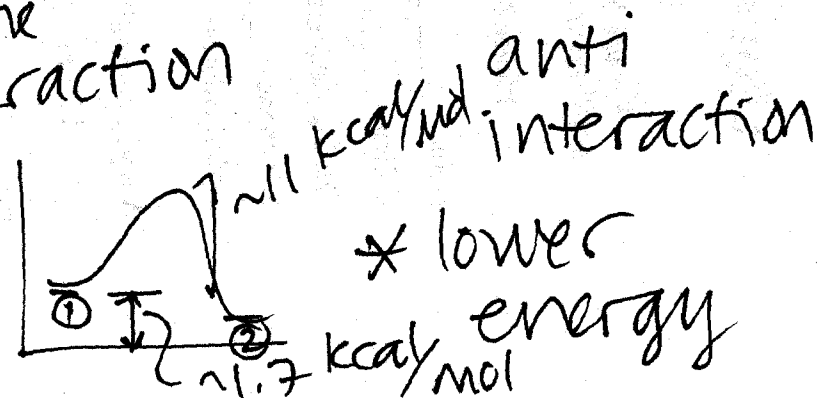


axial groups
have two problems

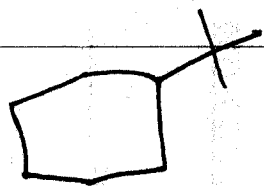
gauche
interaction

1. gauche interaction
w/ rest of ring

2. transannular interactions
w/ other axial gps.



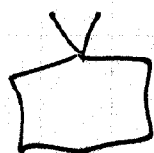
The larger the substituent, the greater the preference for the equatorial position.



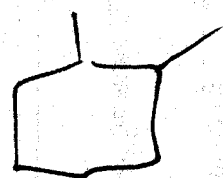
only $\sim 0.01\%$ of the molecules have the t-Bu axial at equil.

What about two substituents?

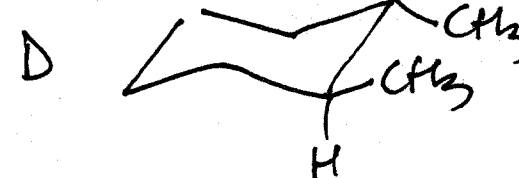
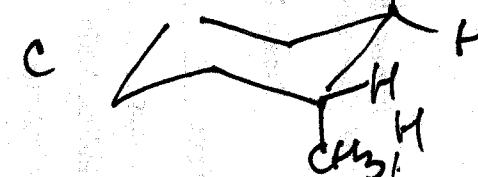
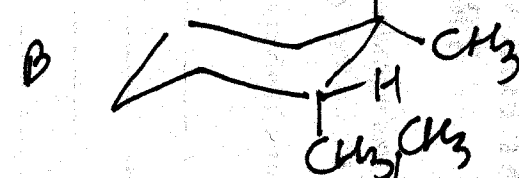
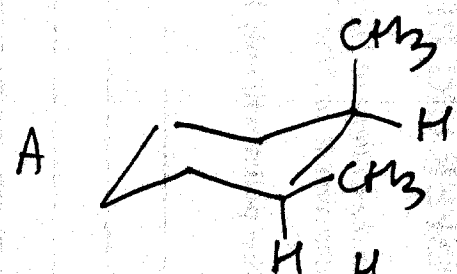
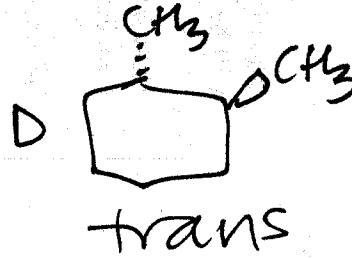
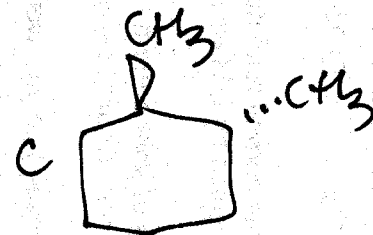
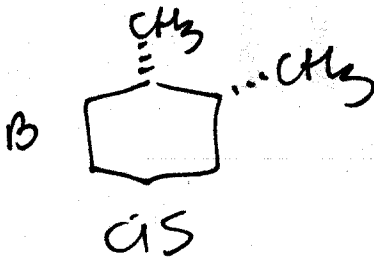
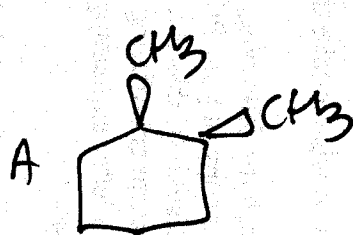
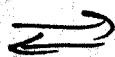
Consider dimethylcyclohexane: 1,1 1,2 1,3 1,4

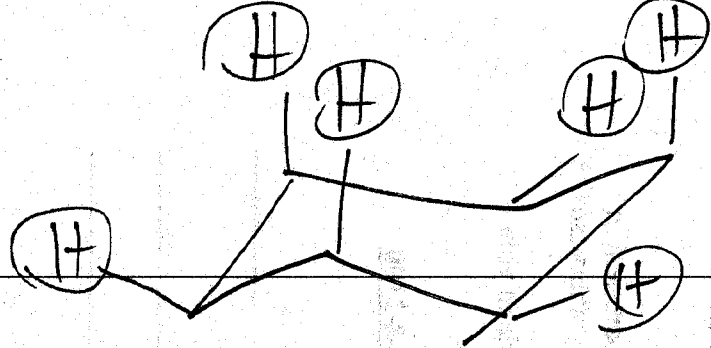


1,1

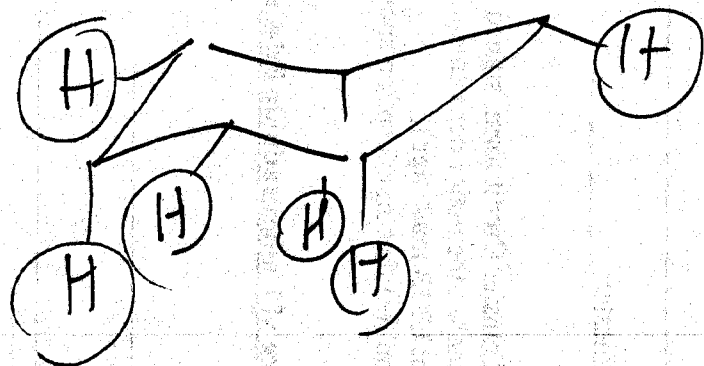


1,2

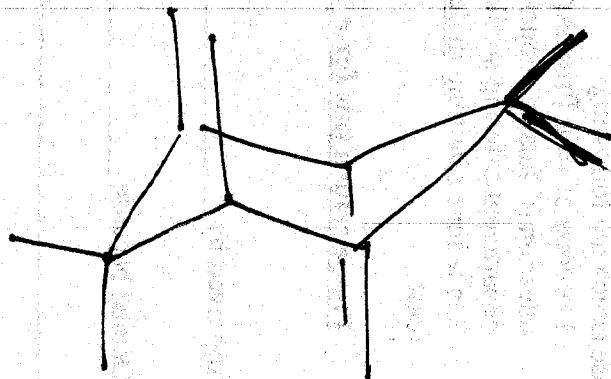




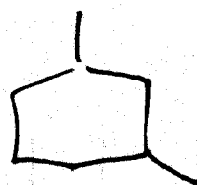
would all be wedges
in a flat drawing.
(angling up)



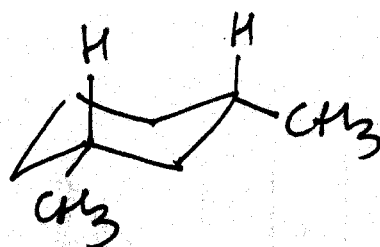
would all be hatches
in a flat drawing
(angling down)



which is axial?
I don't know!

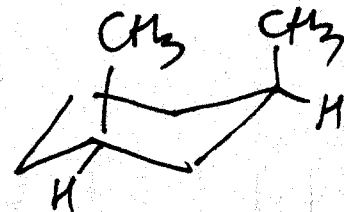


1,3



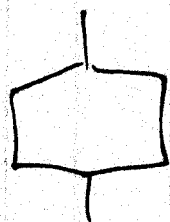
most stable

cis

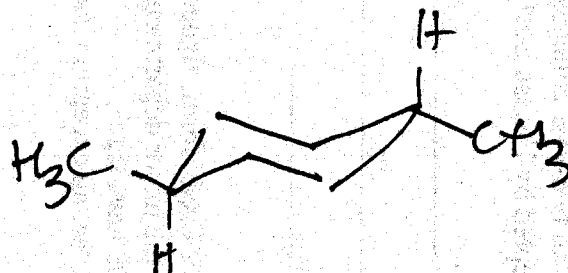


least stable

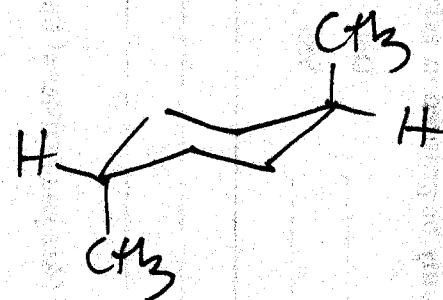
cis



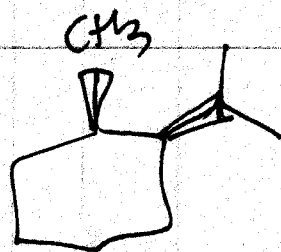
1,4



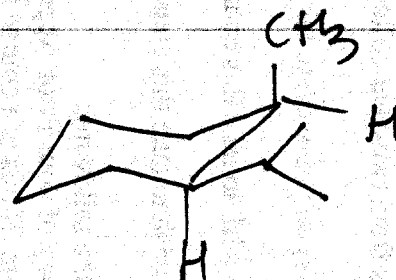
trans



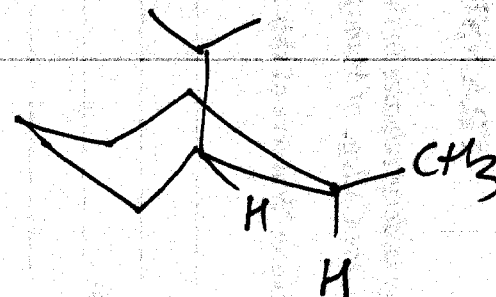
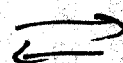
trans



cis



* better



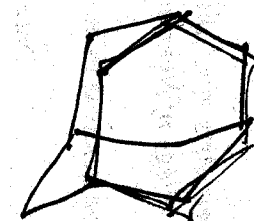
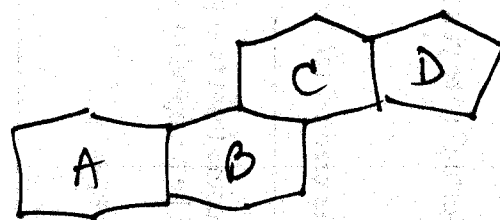
biggest substituent equatorial
(as many substs equatorial as possible)

(bigger rings are fairly common - more strained:

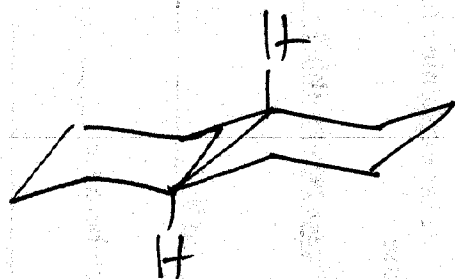
- bond angle distortion
- partial eclipsing interactions
- transannular interactions)

Polycyclic hydrocarbons

steroid nucleus

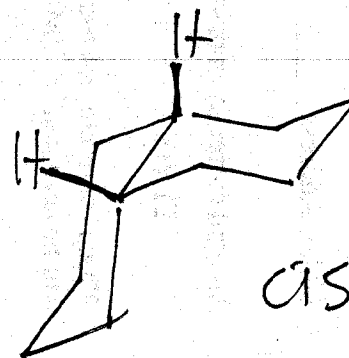
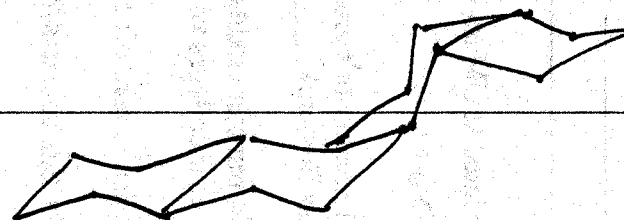


adamantane



trans-decalin

bicyclo [4.4.0] decane



cis-decalin