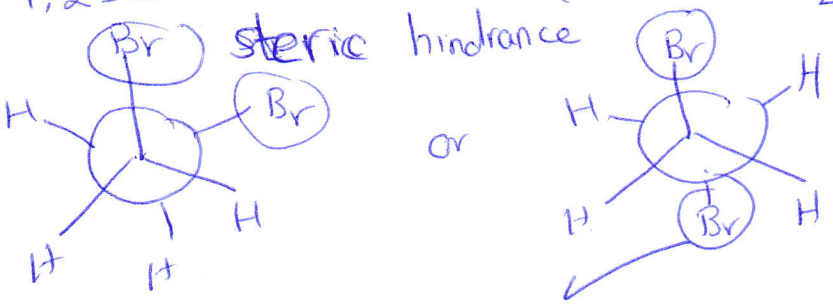
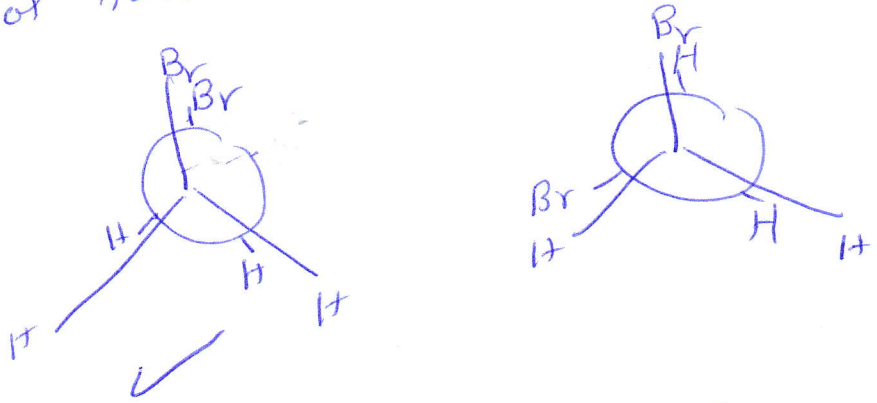
* Conformers (conformational isomers): they are isomers (same molecular formulas) with same arrangments of atoms (not constitutional isomers); they are obtained by interconvertible rotation around σ-bond (single bond).

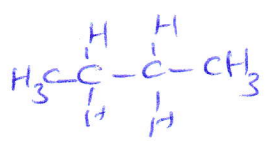
* Eclipsed conformers are less stable than Staggered since there is a torsinal strain in the eclipsed.

Exc 2:- Draw the most stable conformer of 1,2-Dibromoethane. (CH_2Br-CH_2Br).



Exc 3: Draw the least stable conformer of 1,2 Dibromoethane.

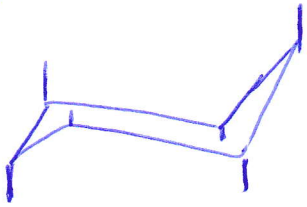


* Try butane citing along C2-C3. 

Conformation of cyclohexane: It has no angle strain (bond angle 109.5°). Two conformational structures are present:

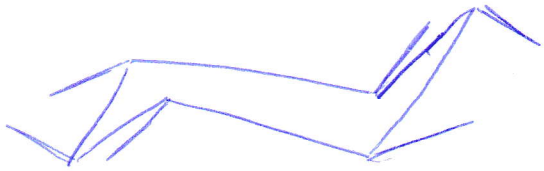
boat (less stable) chair (more stable)

In chair conformation, each carbon has 1 axial bond

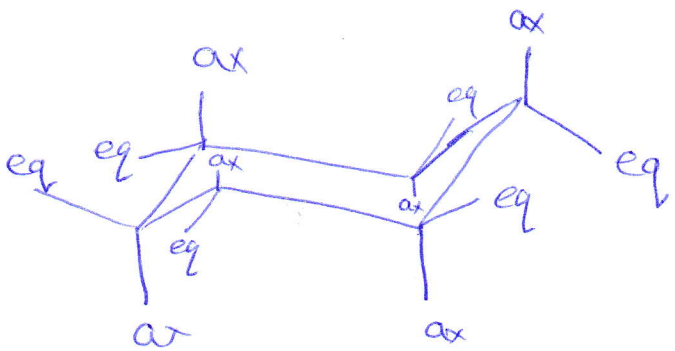


(⊥ on the plane)

and 1 equatorial bond (in the plane).

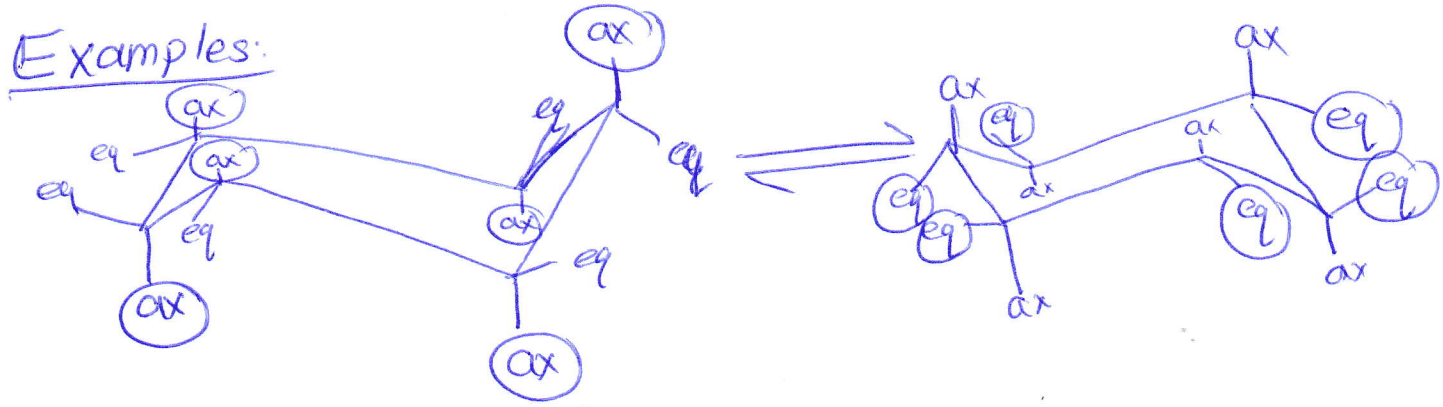


So, each carbon has 1 ax and 1 eq bonds.



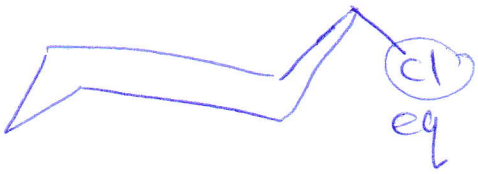
* If ring flips ⟹ each ax bond becomes equatorial bond and each eq. bond becomes an ax. bond.

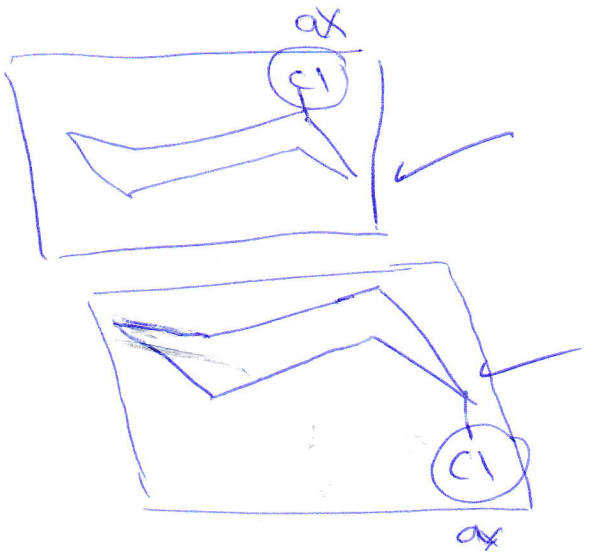
Examples:



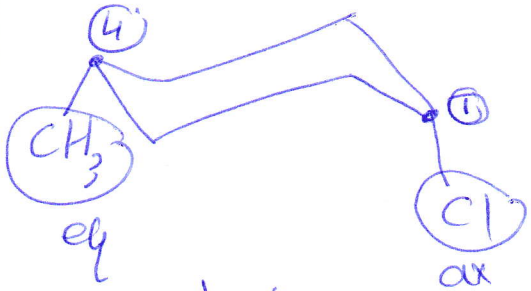
* Do a ring flip for:

a)

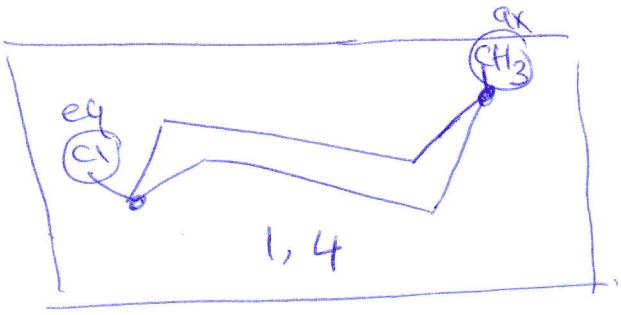




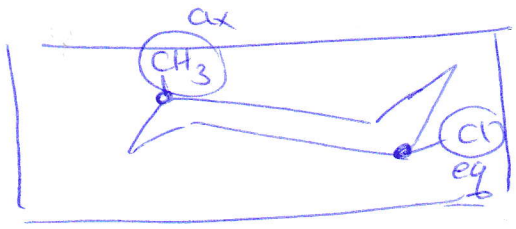
b)



1, 4

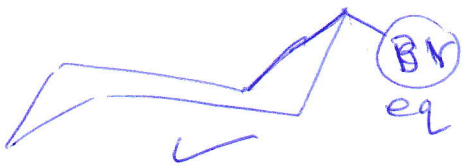


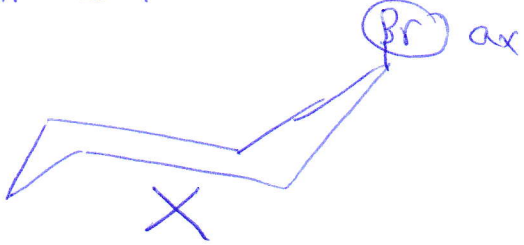
Or ✓



✓

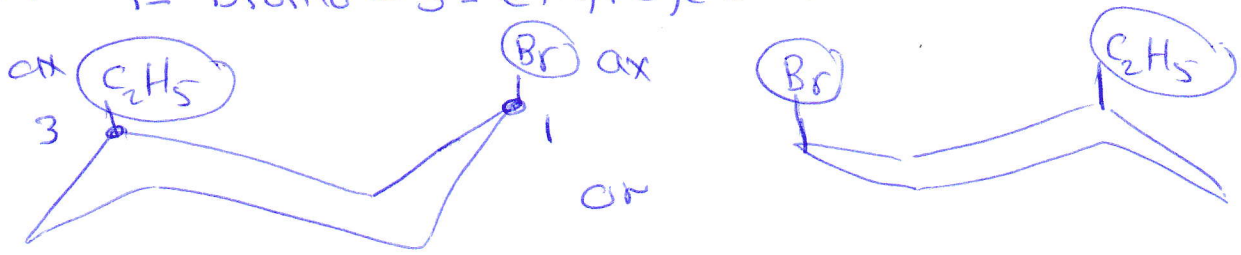
* Draw the most stable chair conformation of Bromocyclohexane.





Equatorial bond is more stable than an axial bond and large groups (atoms) prefer eq.

* Draw the least stable chair conformation of 1- Bromo - 3 - ethyl cyclohexane.



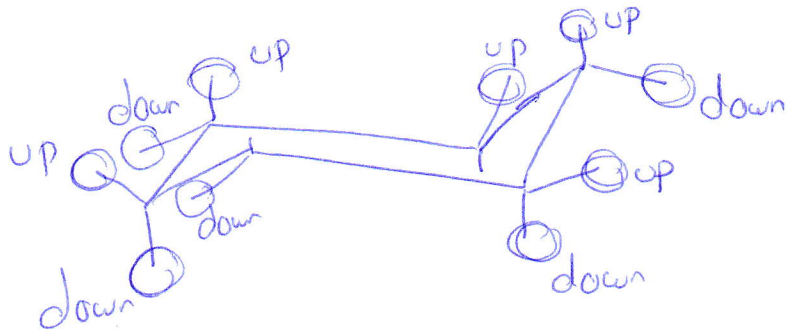
You can select any chair structure, any two carbons.

* Draw the most stable chair conformation of 1- tert- butyl - 1- methyl cyclohexane.

Finally, cis- trans Concept.

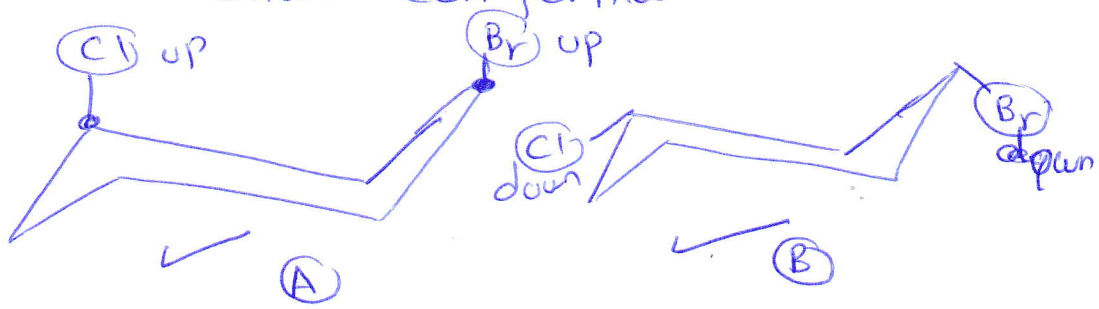
2 substituents are [up] [up] → } cis, while
or [down] [down] → }

1 [up] and 1 [down] → trans.



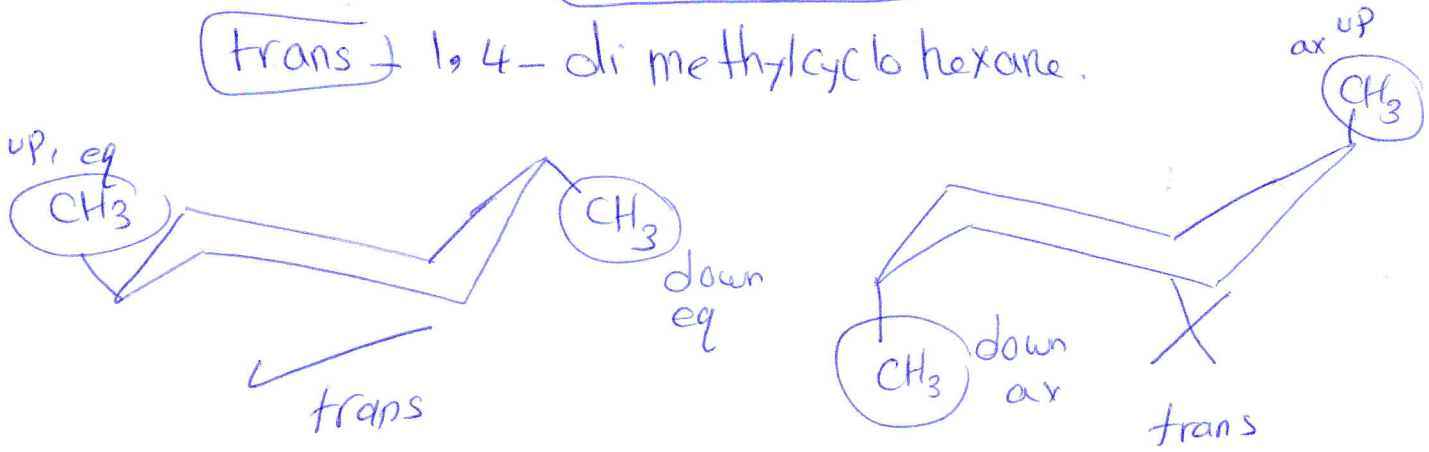
No relation between up, down and eq, ax.

Ex 1. Draw cis - 1- Bromo - 3- chlorocyclohexane in chair Conformation

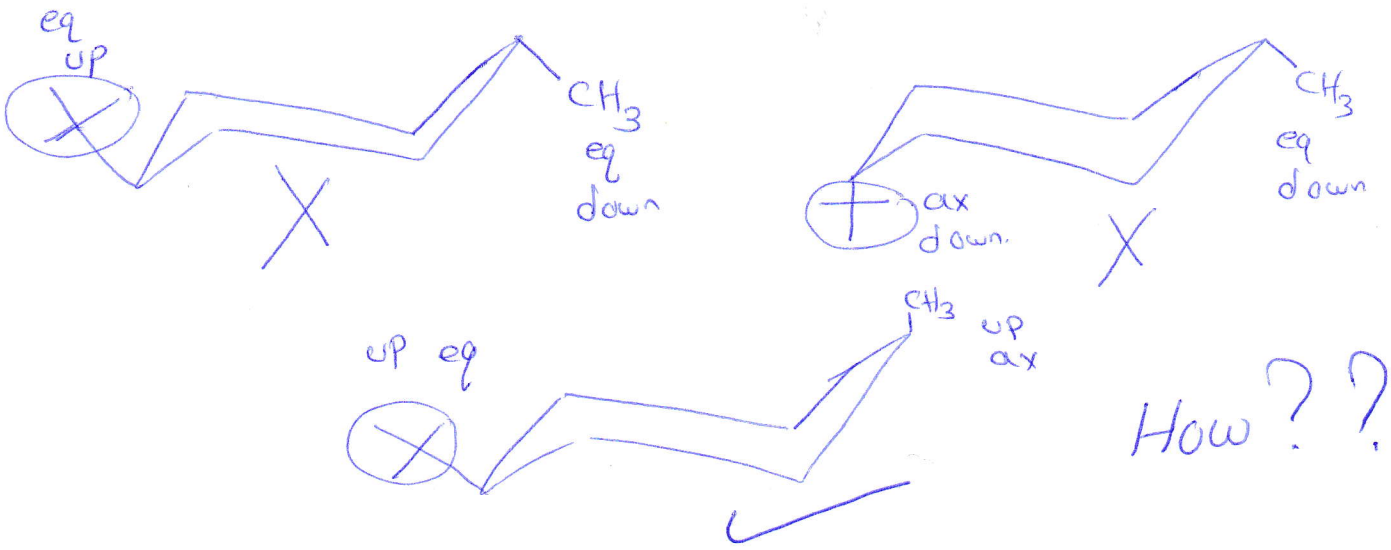


But, in terms of stability ⟹ B is more stable than A.

Ex 2. Draw the most stable conformer of trans - 1, 4- dimethylcyclohexane.

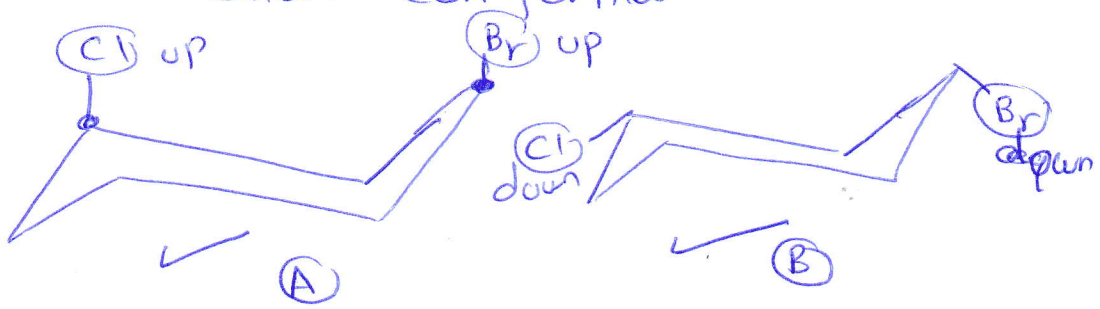


Ex 3. Draw the most stable conformer of cis- 1- tert- butyl- 4- methylcyclohexane.



How??

Ex 1. Draw cis - 1- Bromo - 3- chlorocyclohexane in chair Conformation



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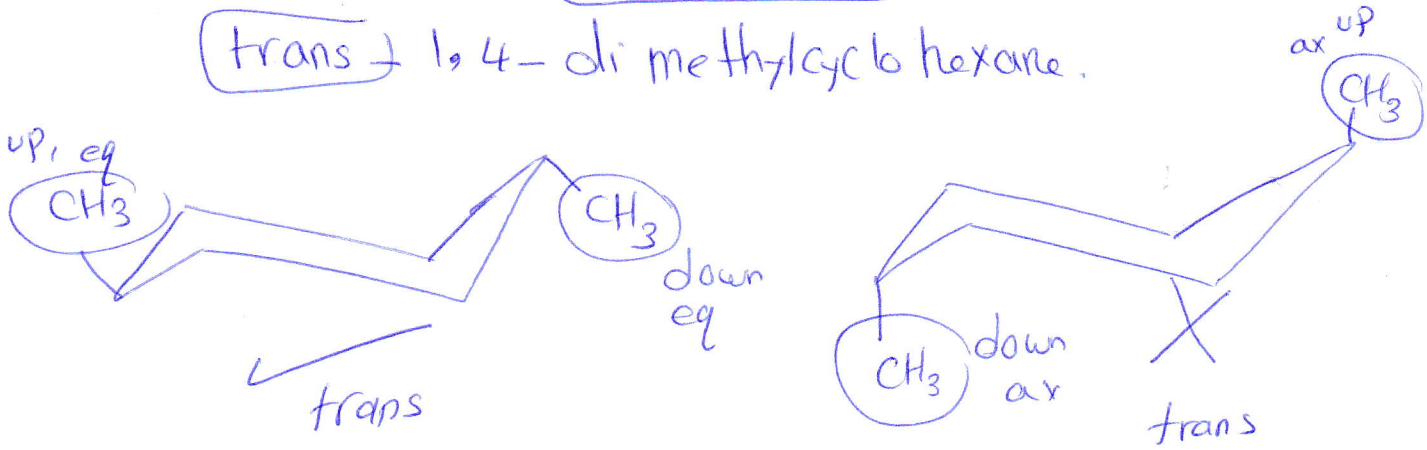

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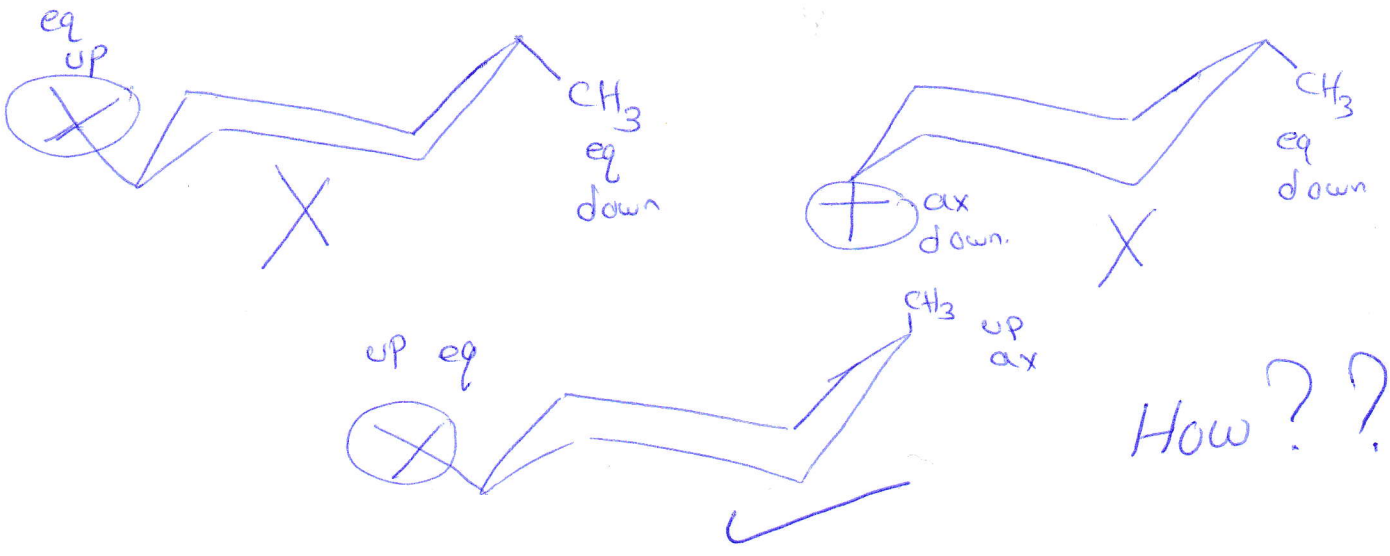

How??