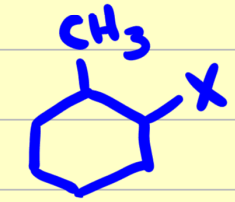
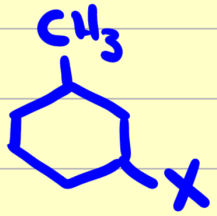
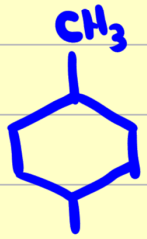
Disubstituted Cyclohexanes



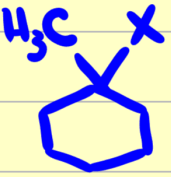
1,2-



1,3-



1,4-



1,1-

2 Stereo-isomers.

2-

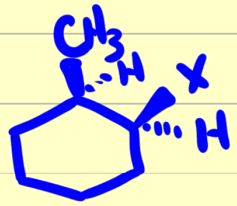
2 stereoisomers each

2-

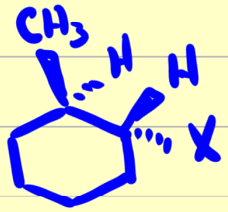
1-

just one

1,2- Disubstituted

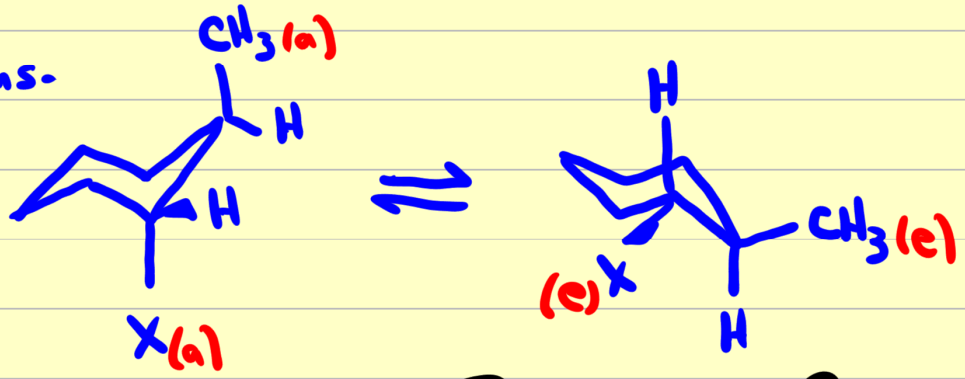


cis 1,2-



trans 1,2-

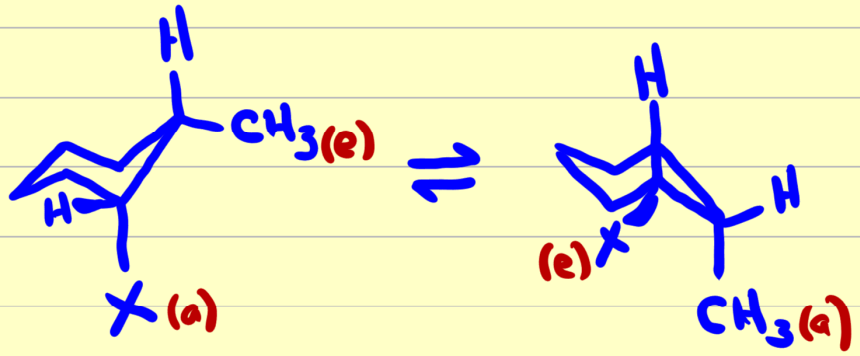
trans-



Preferred Conformation

- Both Groups Get to be Equatorial.

cis-



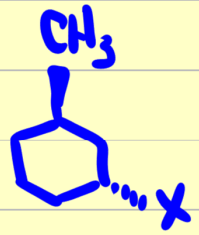
PREFERRED IF $X < CH_3$ IN SIZE

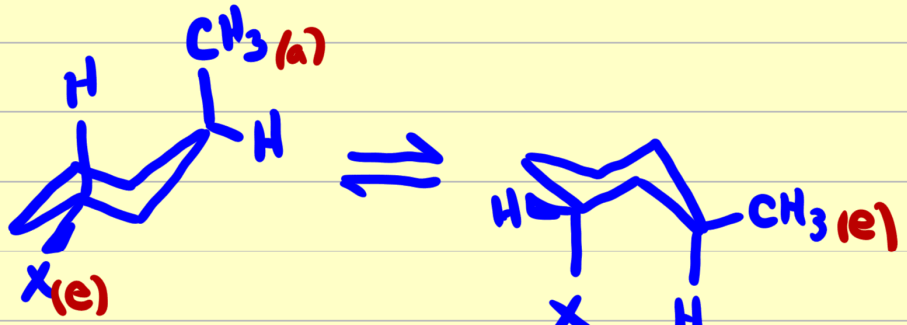
PREFERRED IF $X > CH_3$ IN SIZE

trans- ISOMER IS MORE THERMODYNAMICALLY STABLE, SINCE BOTH CH_3 AND X GET TO BE EQUATORIAL.

1,3-

trans-

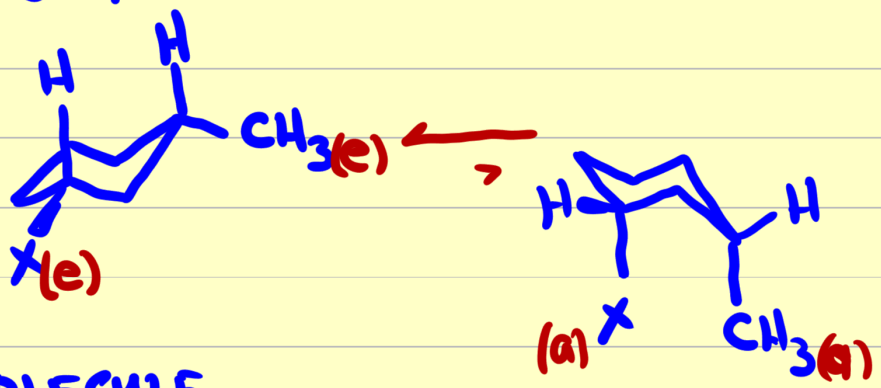




PREFERRED IF $X > CH_3$ in size - has nothing to do with 'priority'

PREFERRED IF $X < CH_3$

1,3- CIS.

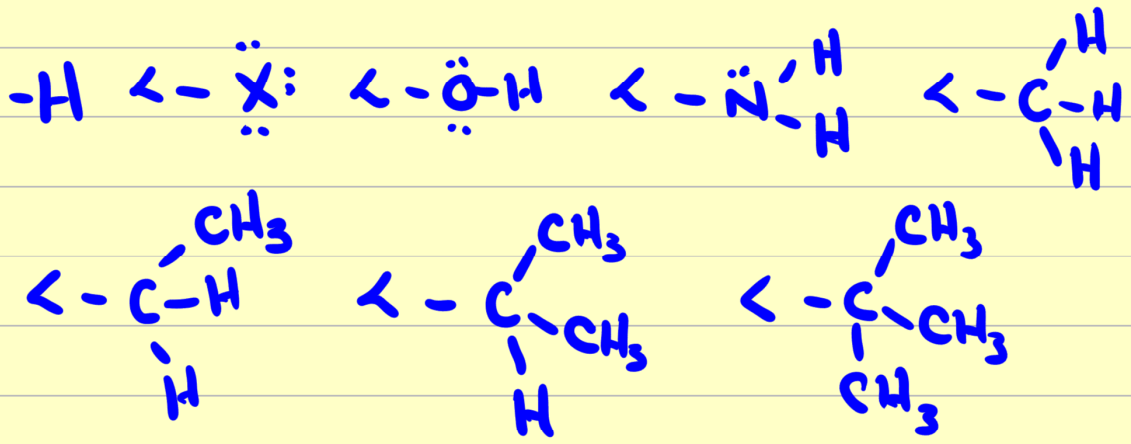


MOLECULE SPENDS "ALL" IT'S TIME HERE (>99.9%)

ACTUALLY MORE STABLE THAN TRANS. ISOMER

1,4- ANALOGOUS TO 1,2-

SO WHAT'S BIG? WHAT'S NOT?



-in general, the more groups on the atom, the larger it is

- axial, equatorial - different CONFORMATIONS - INTERCHANGE THESE CAN

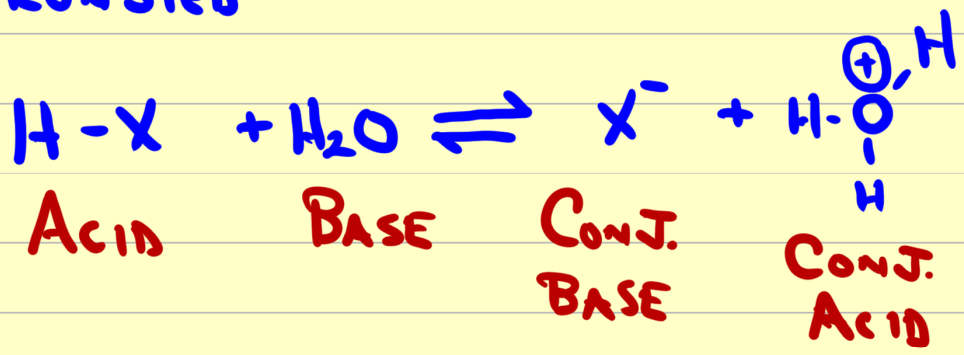
- cis-, trans- different CONFIGURATIONS - DO NOT INTERCHANGE

END OF TEST #1.

CHAPTER 4 - SOME FUNDAMENTALS.

ACIDITY

BRONSTED



Rules:

1. The stronger the acid, the weaker the conj. base
   - converse is true, too

$H_2O \rightleftharpoons H^+ + HO^-$ $K_{eq} = 10^{-14}$ $pK_a = 15.7$

$(H_3C)_3C\text{-}OH \rightleftharpoons H^+ + (H_3C)_3C\text{-}O^-$ $K_{eq} = 10^{-15.5}$ $pK_a \approx 17$

Acidity $H_2O > (H_3C)C\text{-}OH$

Basicity $(H_3C)_3C\text{-}O^{\ominus} > HO^{\ominus}$

2. Acidity and the Periodic Table.