Course CH 343 Sec 003 Lecturer Sam Gellman

Day Wednesday 1:20 Date 9/14/11

Notes Taken By Ellicia Phelps Total # of Pages 4

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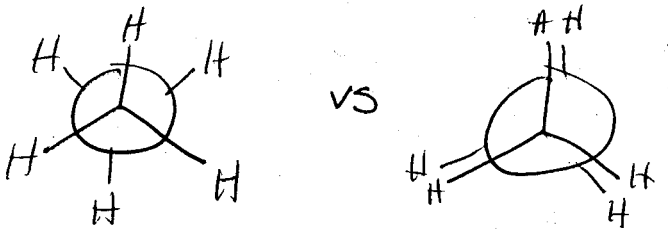
- Extended office "hour" today until 4pm

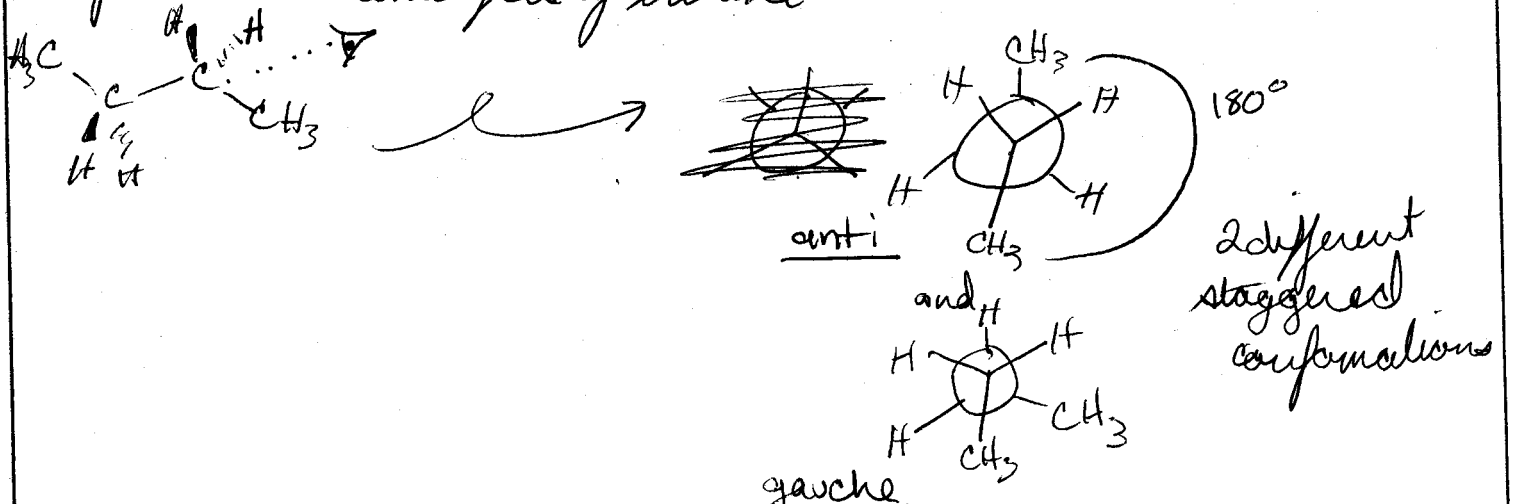
Recall: Conformations of ethane



staggered eclipsed

- ~~Staggered~~ more stable...
  1) Repulsions (CH vs CH) in eclipsed
  2) Favorable $\sigma \rightarrow \sigma^*$ in ~~staggered~~

Conformational analysis of butane



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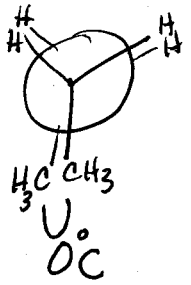
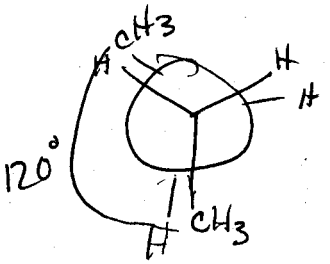
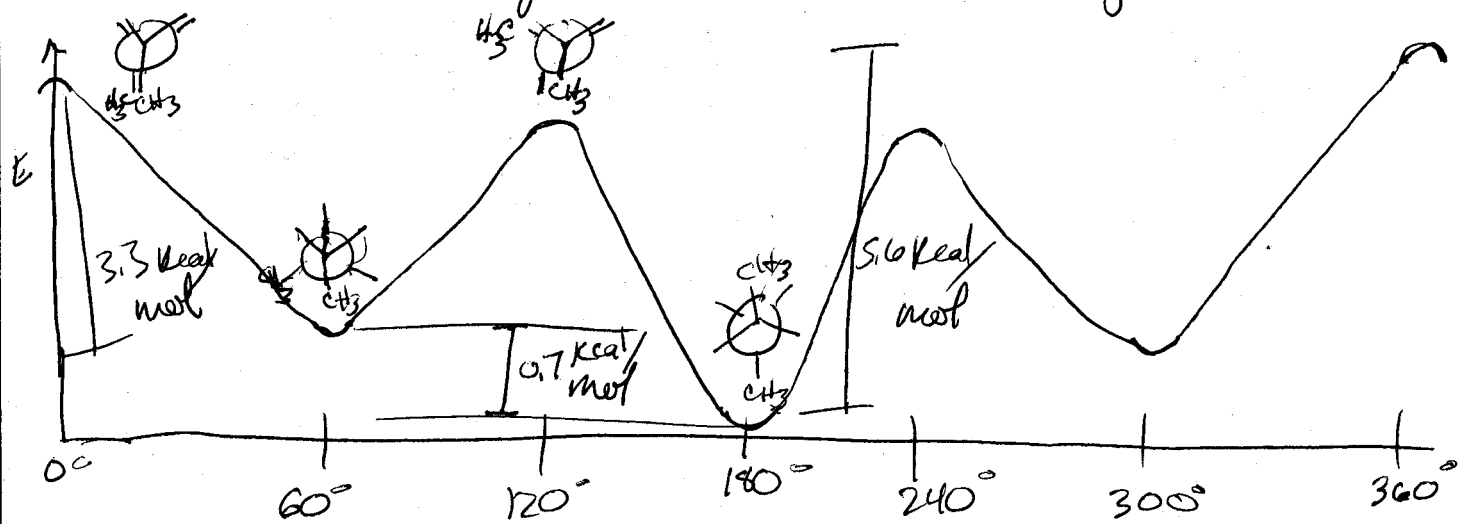
Also 2 eclipsed ~~states~~ .. not named because they're more unstable than staggered



and



Rotational energy Diagram for central C-C bond of butane



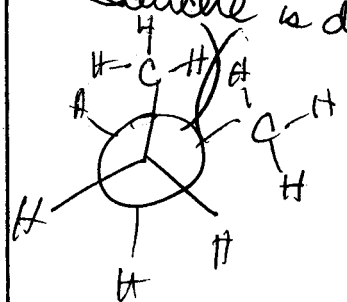
Note:

1) ~~Gauche~~ anti = global energy minimum

Gauche = local energy minimum

2) Gauche is destabilized relative to anti by steric repulsions

H's on methyl bump into each other



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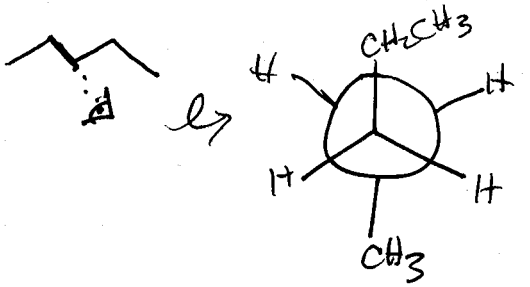
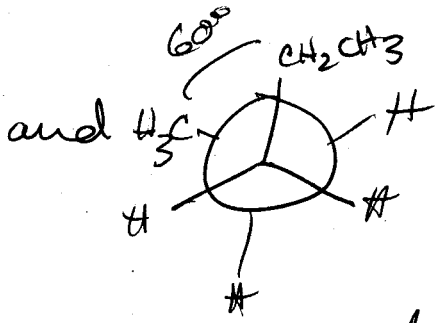




anti conf. more stable than gauche

• Arguments for butane basically valid for longer chains

Branched alkanes (vs. linear)

≥ 4 carbons

C_4H_{10}: $CH_3CH_2CH_2CH_3$ n-butane

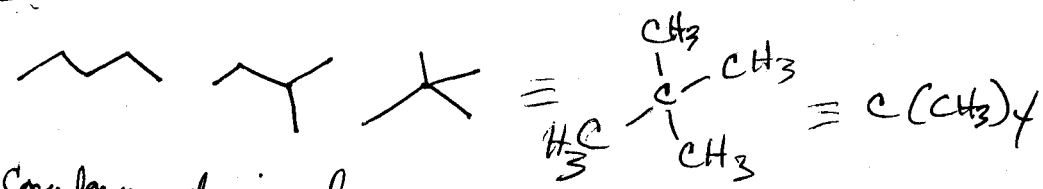
n = normal (straight chain)

VS

$CH_3-CH(CH_3)-CH_3$ isobutane (i-butane)

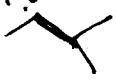
isomers

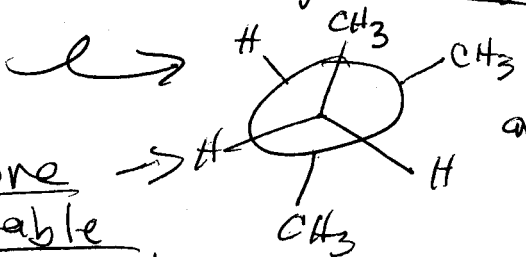
C_5H_{12}



$\equiv C(CH_3)_4$

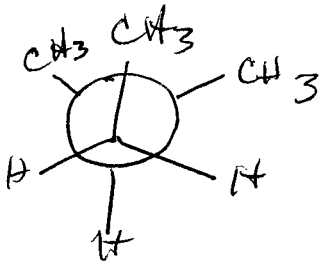
Conformational analysis example





more stable → 1 gauche interaction

and



2 gauche interactions

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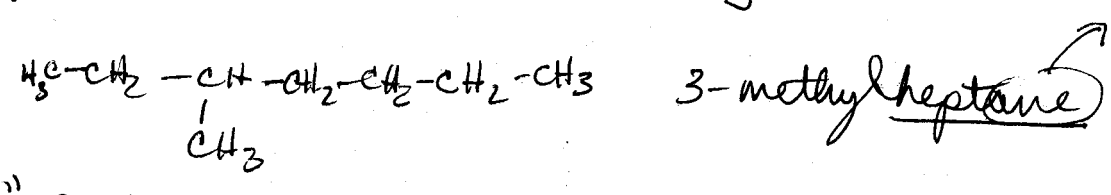
Alkane Nomenclature p.58-70

Name ⇏ structure (not the other way)

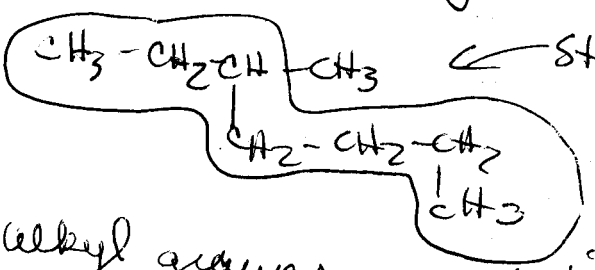
Ex:



"Heptane"-family (this molecule is a derivative of heptane)

"3-methyl" CH_3 substituent @ C#3

- Family name is based on longest linear array of carbons
- Do not be misled by the way a molecule is drawn!



Alkyl groups as substituents

CH_4 = methane ⟶ $-CH_3$ methyl