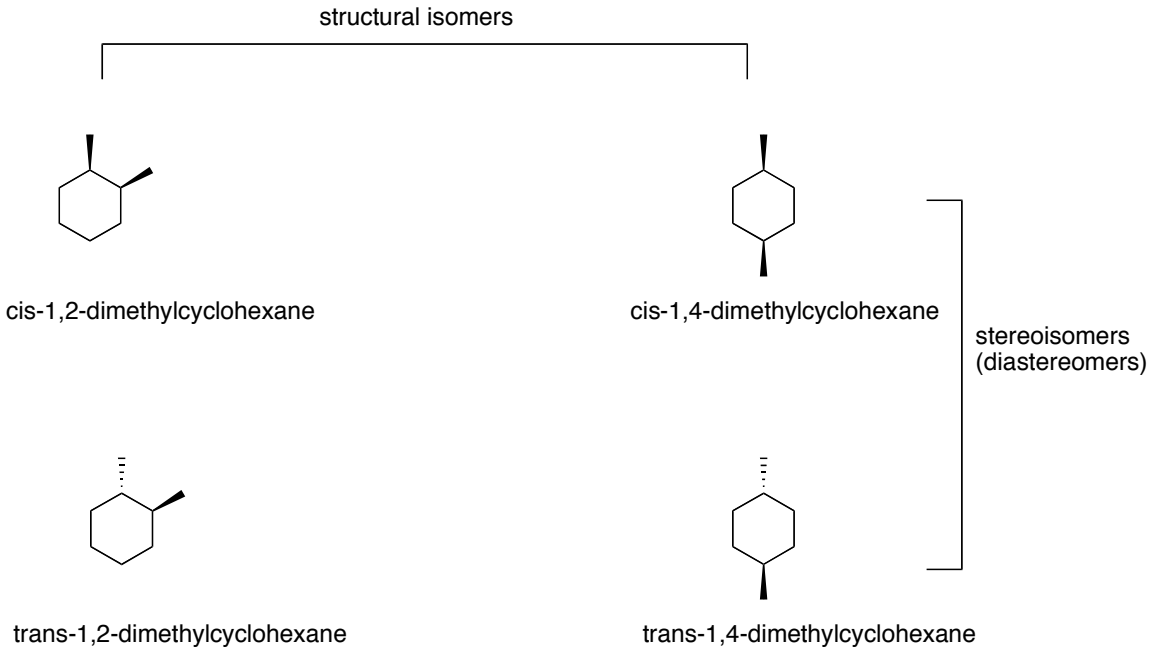
Review

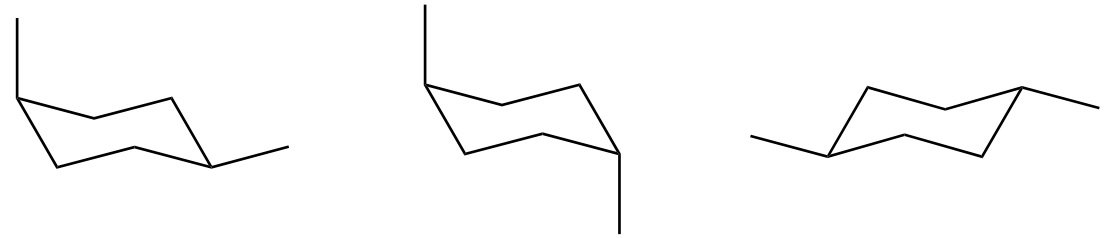
Conformations/Conformers – Different shapes a single molecule may assume via rotation around single bonds
Isomers - Different compounds with same molecular formula but a different arrangement of atoms

Polysubstituted Cyclohexanes (Continued):

1,2-dimethylcyclohexane and 1,4-dimethylcyclohexane



cis-1,4-dimethylcyclohexane and trans-1,4-dimethylcyclohexane:

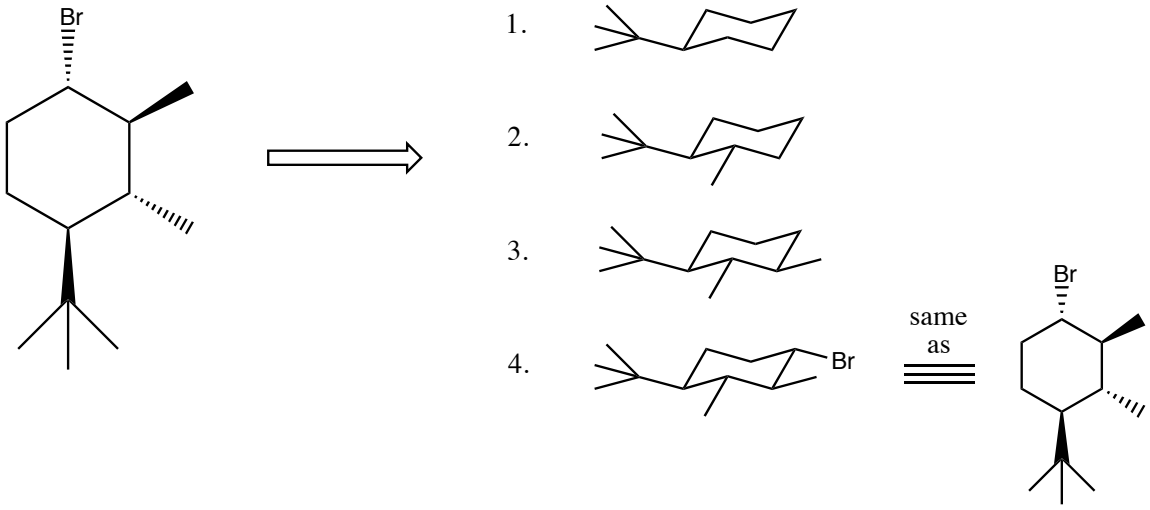


cis-1,4-dimethyl trans-1,4-dimethyl trans-1,4-dimethyl

DIFFERENT COMPOUNDS!!! SAME compound, different CONFORMATIONS

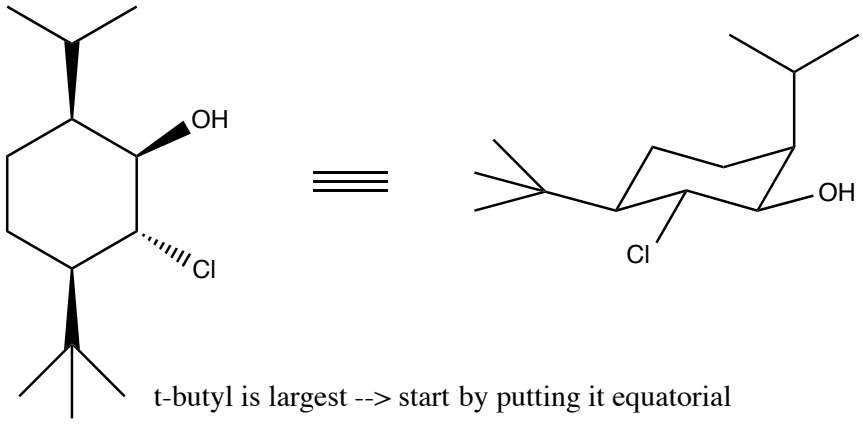
How to draw the most stable conformation of substituted cyclohexanes:

1. Start by drawing the chair conformation of cyclohexane
2. Put the largest group in an equatorial position
3. Draw the next group(s) on the correct side (face) with respect to the largest group



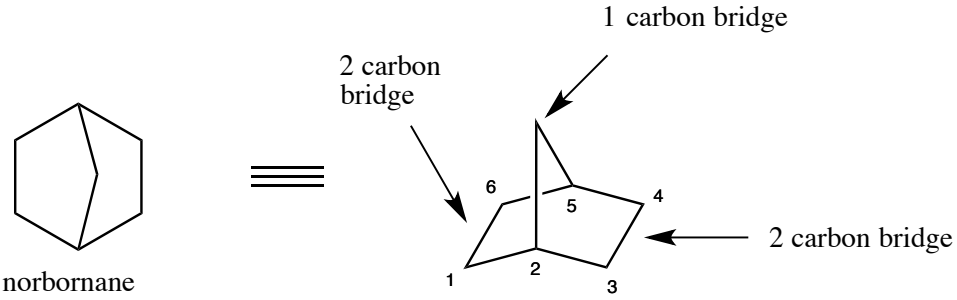
Note that the largest substituent (t-butyl) is placed in the equatorial position to avoid destabilizing 1,3-diaxial interactions

Another example:



t-butyl is largest --> start by putting it equatorial

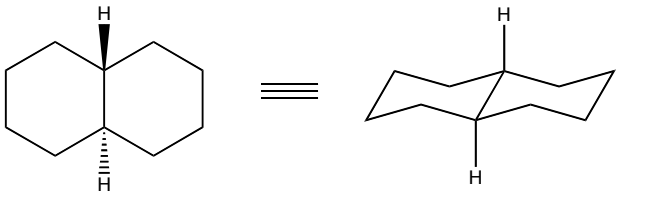
Examples of basic bicyclic compounds:



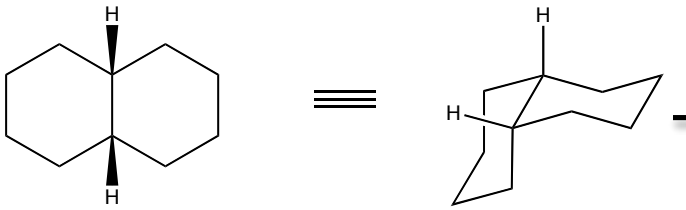
norbornane
C_7H_{12}
Degrees of unsaturation: 2

2 bridge head carbons (2 and 5)
6 membered ring in a boat conformation

trans-decalin:



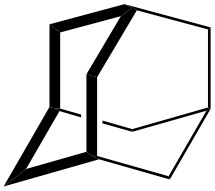
cis-decalin:



stereoisomers

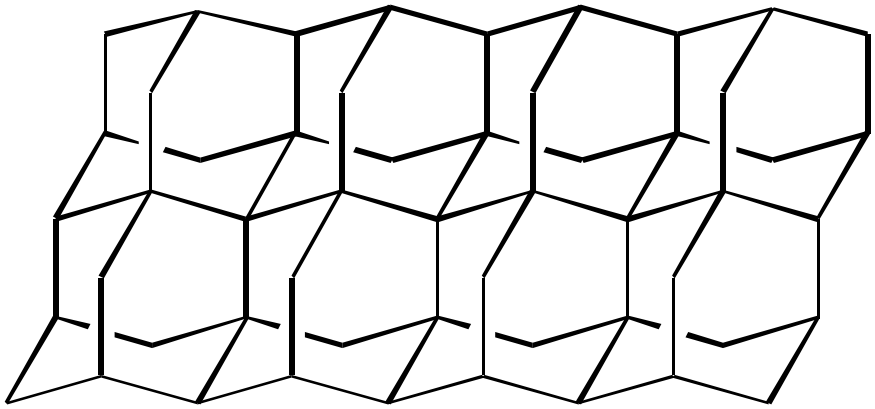
2 degrees of unsaturation

A tricyclic compound:

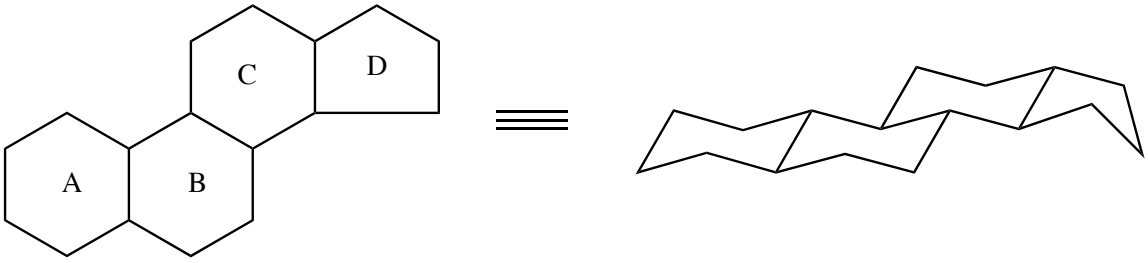


Adamantane

Diamond:



Steroids:



trans-fused