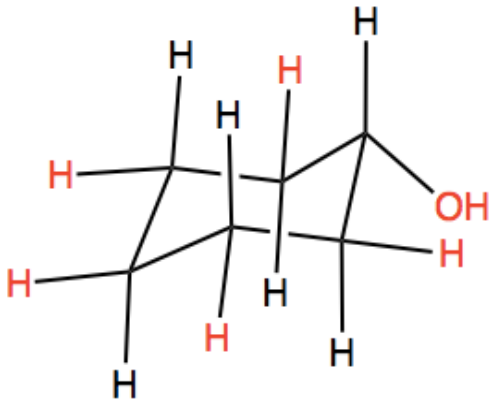
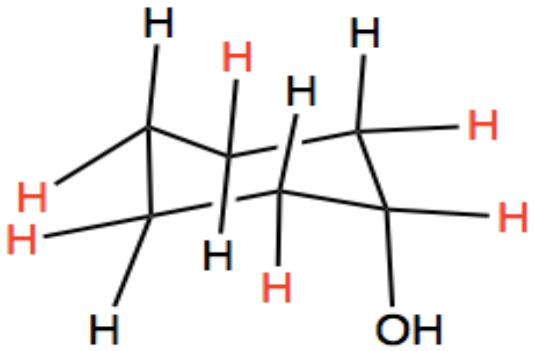
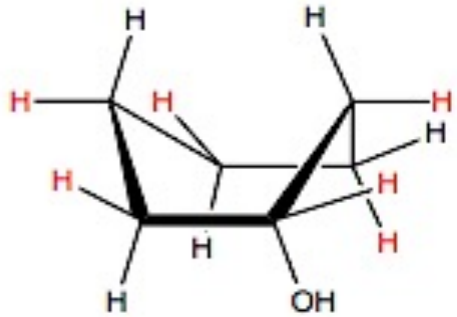
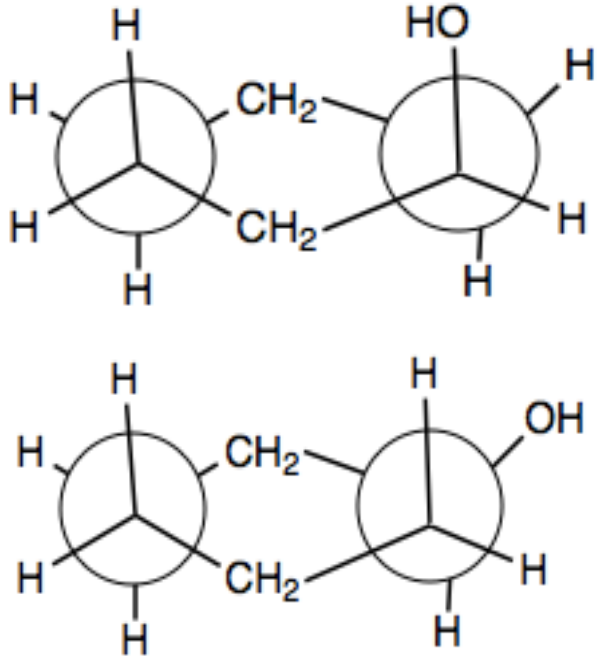
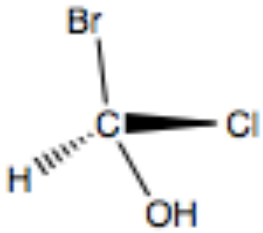
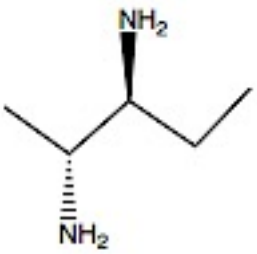
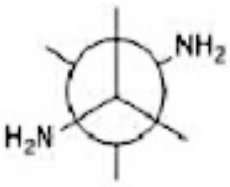
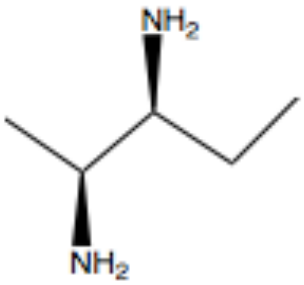
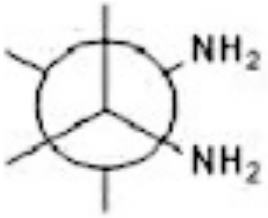
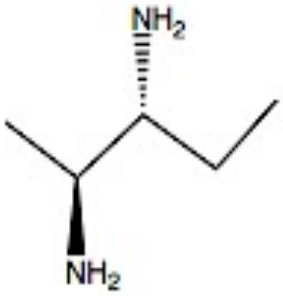
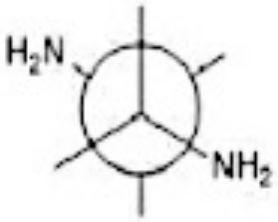
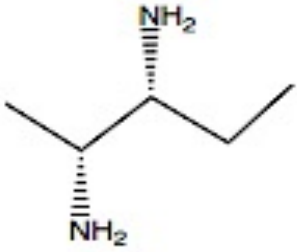
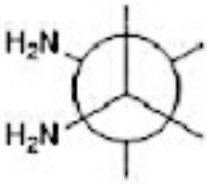
Cyclohexanol

Conformations	Explanations
#1-3 	To the left represents cyclohexanol in the most stable conformation. Indicated in red are the equatorial substituents and indicated in black is the axial substituents. This is considered the most stable conformation because the hydroxyl group the function group in the hydrocarbon is in equatorial position, therefore it will not make any steric interactions with neighbouring hydrogen's.
#4-5 	Red= equatorial, Black=axial, This image to the left demonstrates the inverted chair conformation of cyclohexanol. When this molecule is rotated the equatorial substituents become axial and the substituents in the axial position become equatorial. This conformation is unstable because it puts the hydroxyl group in the axial position, because of this position it creates the very unstable 1.3 diaxial interaction.
#6-8 	Red= equatorial, Black= axial. This is the boat conformation of cyclohexanol. This is an unstable conformation as it creates steric interactions. The boat can be twisted vertically or horizontally which will allow it to produce other boat conformations.

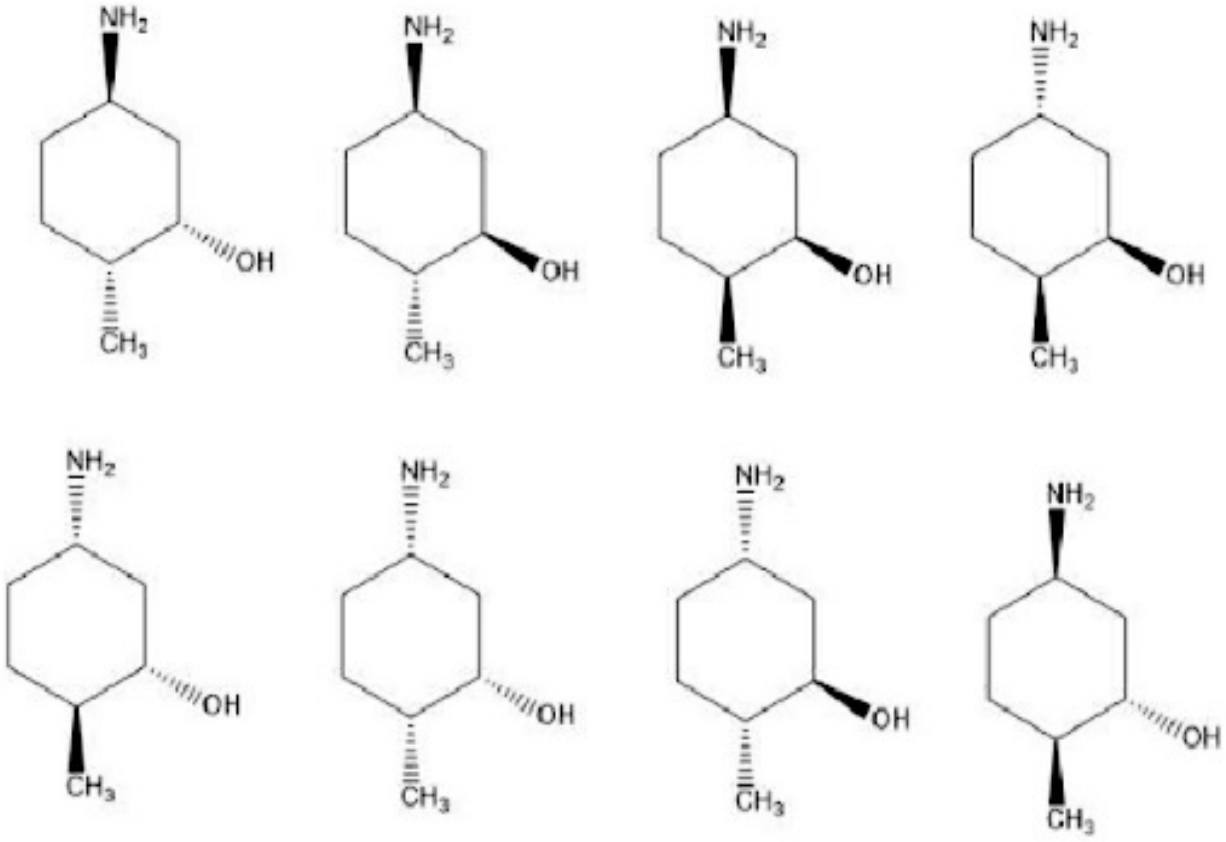
Newman projection	Explanation
#12-10  	The images to the left represent the Newman's projection of the chair conformation as well as the inverted Newman's projection. As the chair is flipped the hydroxyl group changes from the equatorial position to the axial position, which is the most unstable chair conformation of cyclohexanol.

Questions

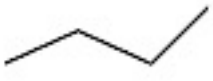
Zigzag Structure	Explanation
#1  	To the left represents the zigzag structure of the R isomer of CH (OH)ClBr. Bromine will first take priority, than chlorine, the hydroxyl group and finally hydrogen. This is organized in terms of highest atomic mass to the lowest.
#2  	 There are about 4 different possible isomers of 2,3-diaminopentane. Here is 1 of them.

#2			There are about 4 different possible isomers of 2,3-diaminopentane. Here is #2.
#2			There are about 4 different possible isomers of 2,3-diaminopentane. Here is #3
#2			There is about 4 different possible isomers of 2,3-diaminopentane. Here is #4.

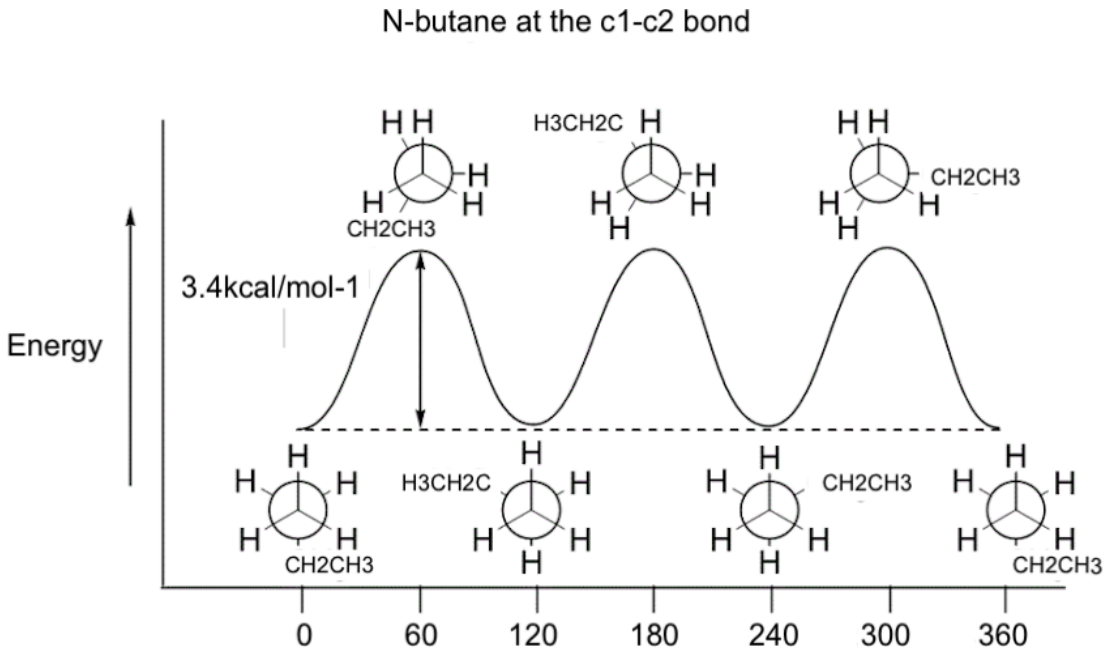
#3. There are 8 stereoisomers $2^n=2^3$



Newman's projection

Zig zag structure	Explanation
#1. N-butane 	The zigzag structure to the left represents n-butane. N-butane consists of a 4 hydrocarbon chain, the formula is C_4H_{10}

Energy diagram



-Figure 1: energy diagram showing the energy variation in the free energy of n-butane as the dihedral angle change by 60 degrees intervals

Question: the difference between the 2 most stable conformations is 0cal/mol

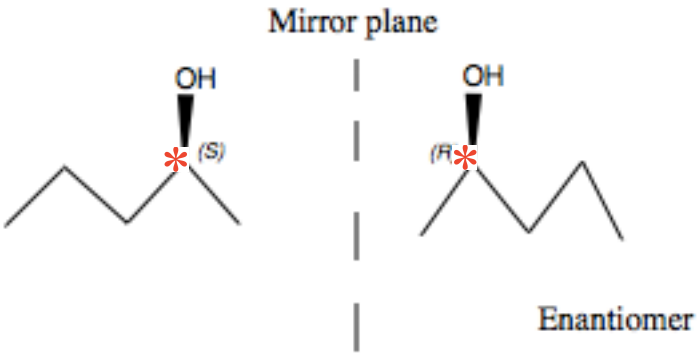
Enantiomers and diastereomers

a)$CH_3CH_2CH_2CH(OH)CH_3$

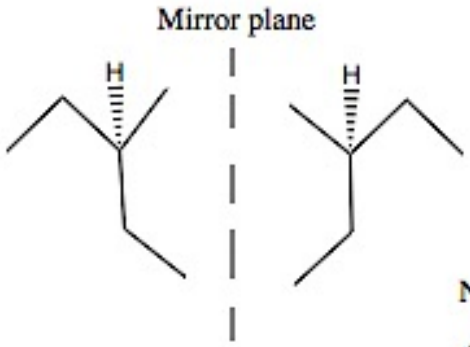
Legend

* =

Stereogenic centre
Diast= diasteromer
Enan= enantiomer

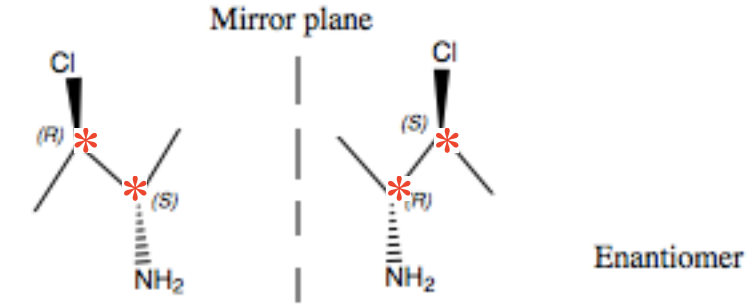


c) $CH_3CH_2CH(CH_2CH_3)CH_3$

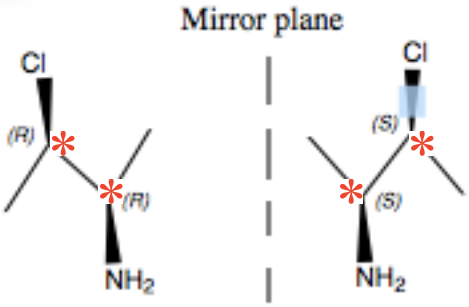


No stereogenic centre. Therefore this is not enantiomer or diastomer but the same molecule. This is an achiral molecule

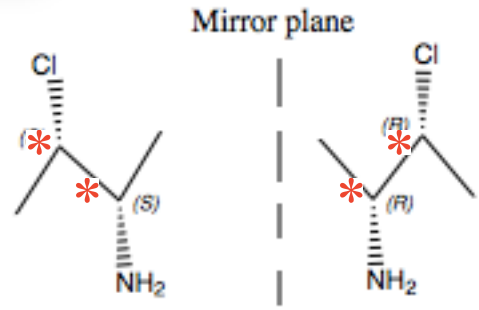
b) $CH_3CClHCH(NH_2)CH_3$



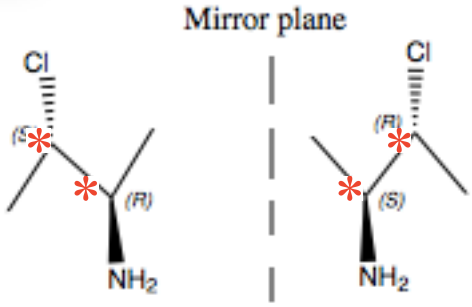
Enantiomer



Enantiomer

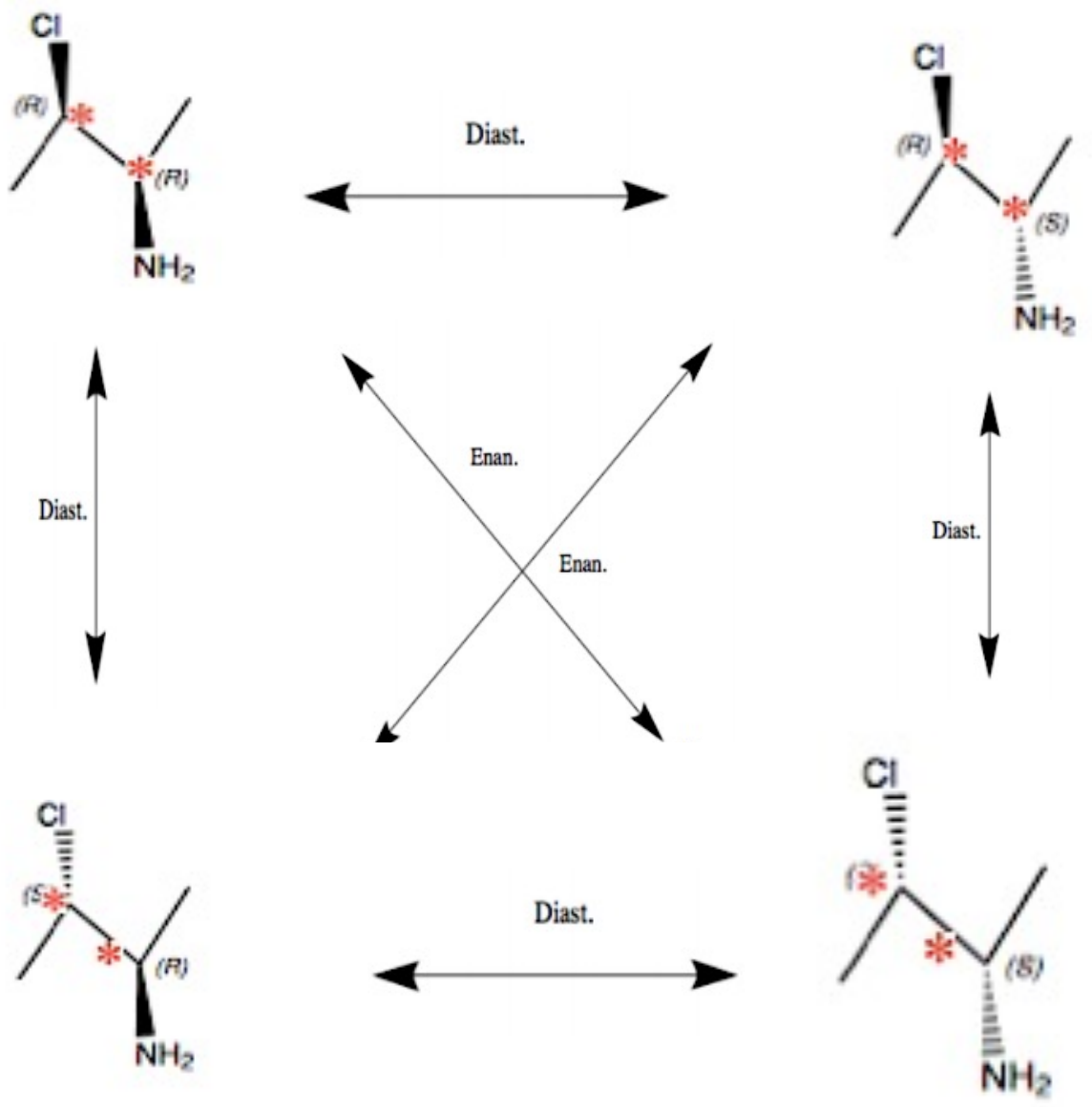


Enantiomer

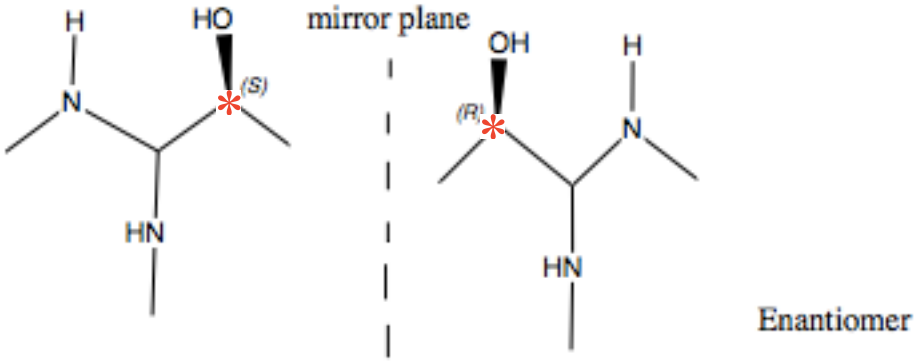


Enantiomer

All possible stereoisomers for compound B



d) $CH_3NHCH(NHCH_3)CHOHCH_3$



e) $CH_2CHClCH_2OCH_2CHCl$