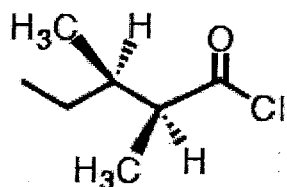
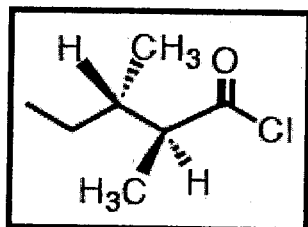


Problem Set IV - KEY -

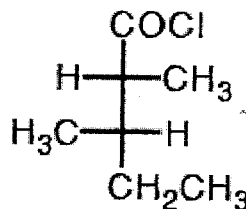
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Sections C, D, E
cari@chem.ucla.edu

1. Label each structure compared to that in the box as **SAME**, **ENANTIOMER**, **DIASTEREOMER** or **STRUCTURAL ISOMER**.

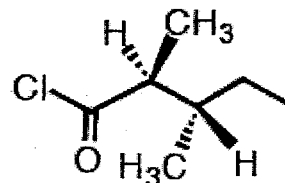
(a)



Diastereomer

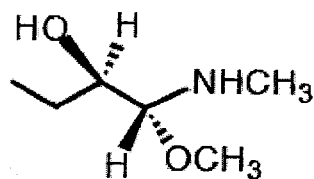
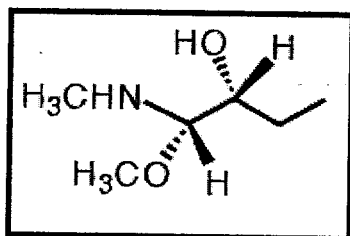


Diastereomer

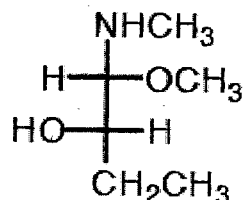


same

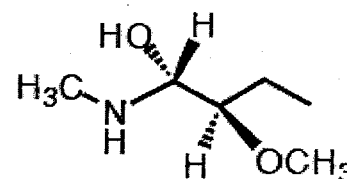
(b)



Diastereomer



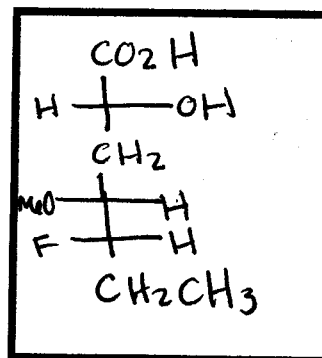
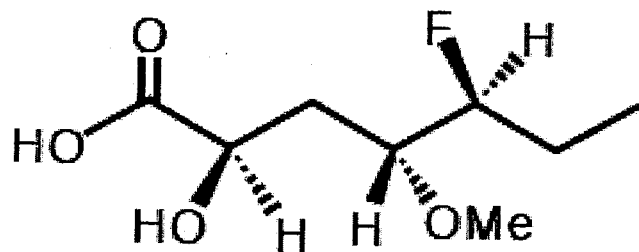
enantiomer



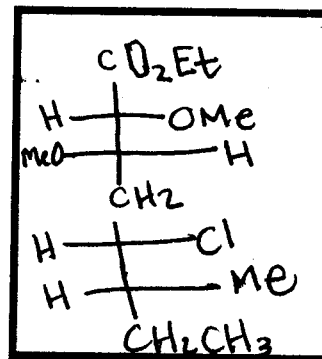
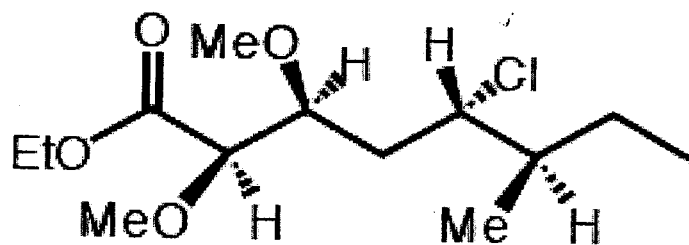
structural isomer

2. Draw the Fischer projection corresponding to the structure provided

(a)



(b)



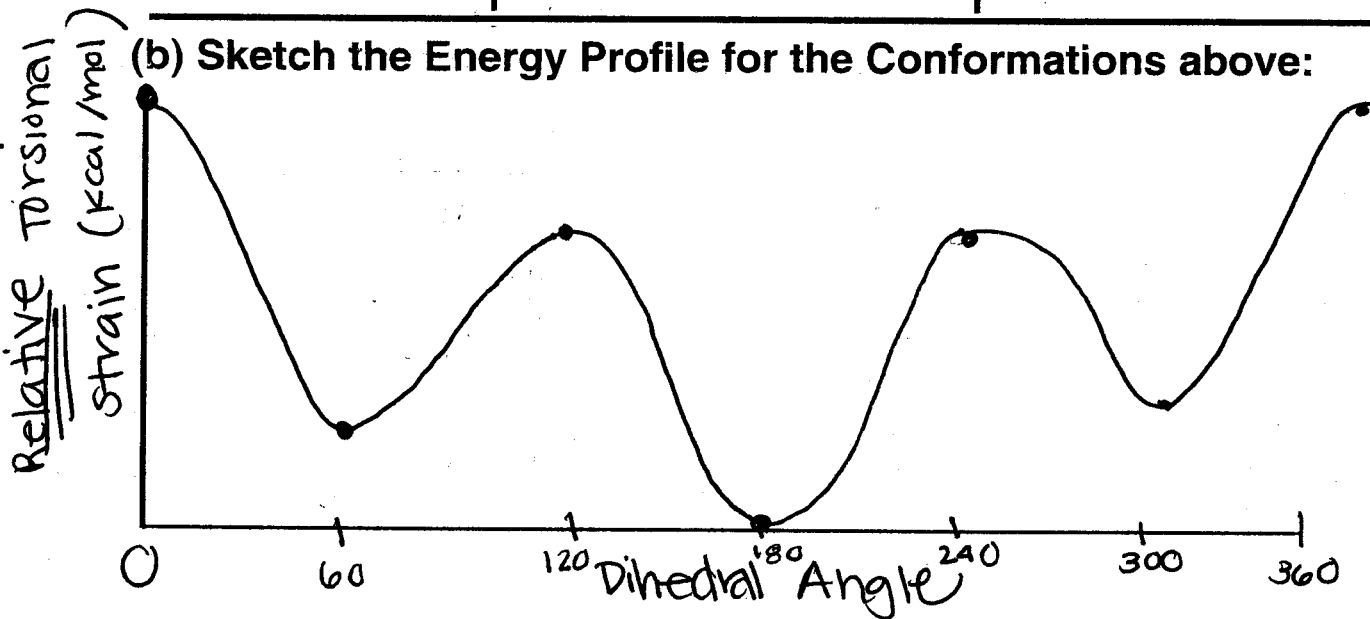
2. Conformational Isomerism

(a) Fill in the table about the conformational isomers of butane.

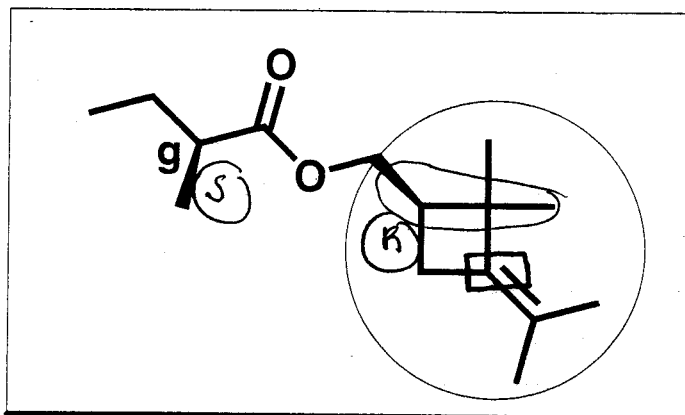
Newman Projection	Methyl-Methyl Dihedral Angle	Methyl-Methyl Relationship
	180°	anti-periplanar
	120°	Eclipsed
	60°	gauche
	0°	syn-periplanar

torsional strain

(b) Sketch the Energy Profile for the Conformations above:



3. A Combined Problem.



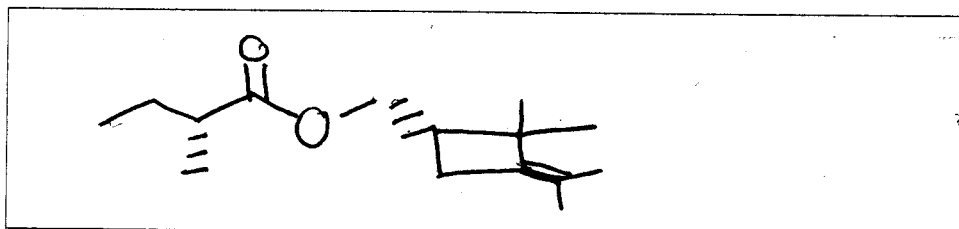
(a) Circle the two atoms and/or groups that cause the greatest torsional strain in the portion of the molecule **circled** above.

(b) In that same region, box the atom of the vertex (middle) of the bond angle that causes the greatest angle strain.

(c) How many stereocenters are in the above molecule? 2

(d) Label each stereocenter as R or S.

(e) Draw the enantiomer of the above molecule in the box below:

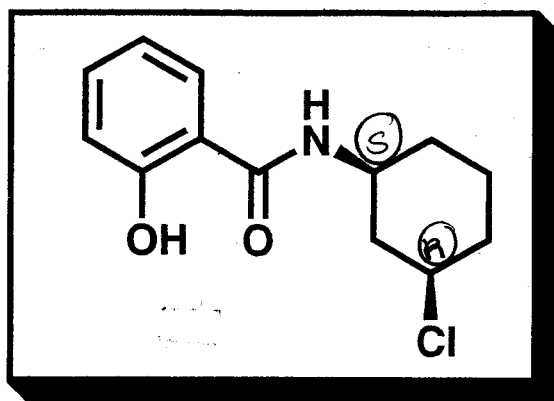


(f) How many stereoisomers are possible? $2^2 = 4$

(g) If the methyl and the hydrogen attached to carbon "g" were switched, what would be the stereoisomeric relationship of the new structure to that of the original molecule?

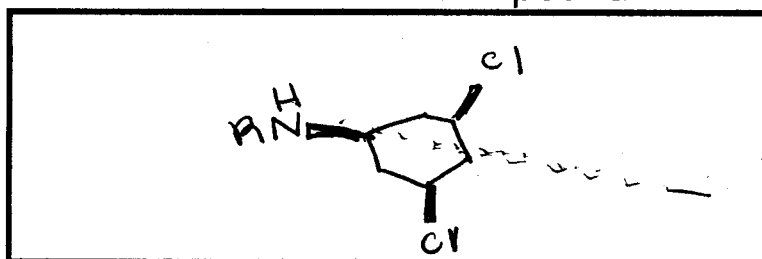
Diastereomer

4. Ripped-off from a Dr. H exam:



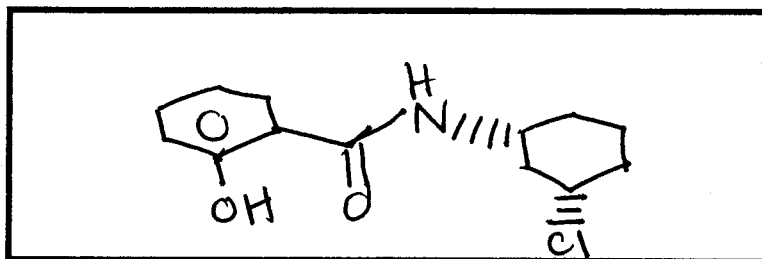
(a) Label each stereocenter as R or S

(b) By adding, subtracting, or otherwise changing just one atom, redraw the structure so that it is a meso compound.

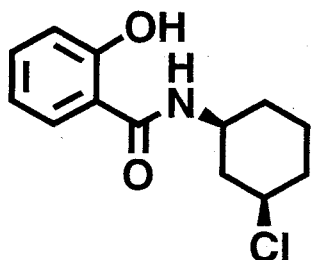


(c) Why is it meso? There are stereocenters, but the molecule is achiral because of the internal plane of symmetry.

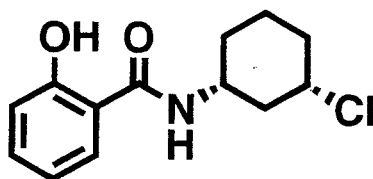
(d) Draw the structure of the enantiomer.



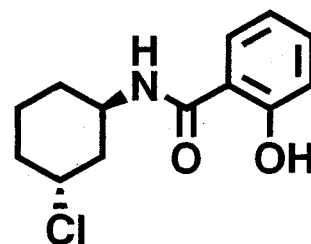
(e) Compare the following structures to the given molecule and label each as **enantiomer**, **diastereomer**, **meso**, **same**, or **none of these**, or **conformational isomer**.



conformational



enantiomer



diastereomer