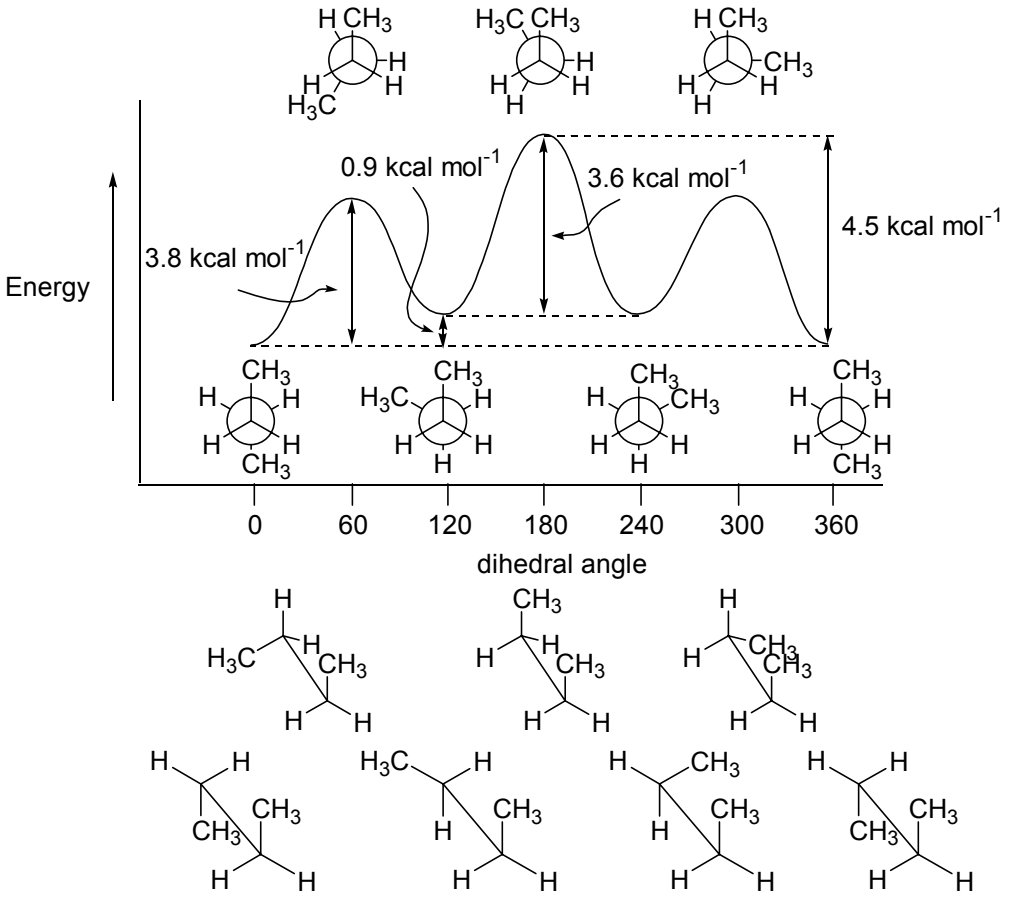
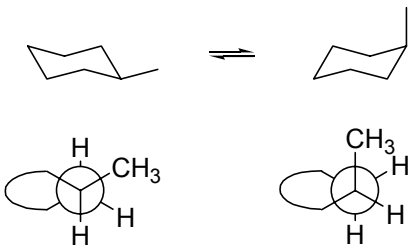
CHM 3126/3526
Experiment 1 Answers

1.



2.

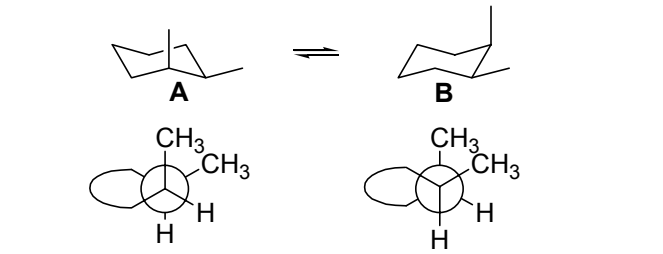


2 gauche interactions
2 X 0.9 = 1.8 kcal mol^{-1}

(bold indicates gauche interactions)

3.

Cis:



3 gauche interactions
3 X 0.9 = 2.7 kcal mol^{-1}

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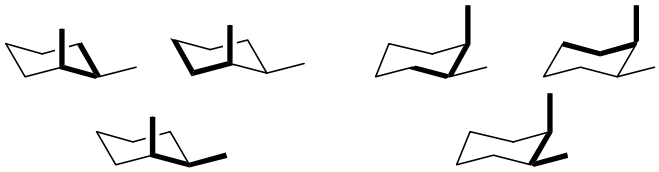
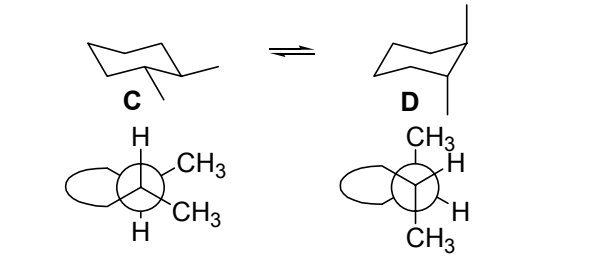


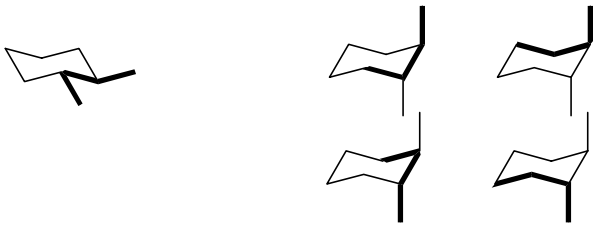
(bold indicates gauche interactions)

Trans:



1 gauche interaction
1 X 0.9 = 0.9 kcal mol^{-1}

4 gauche interactions
4 X 0.9 = 3.6 kcal mol^{-1}



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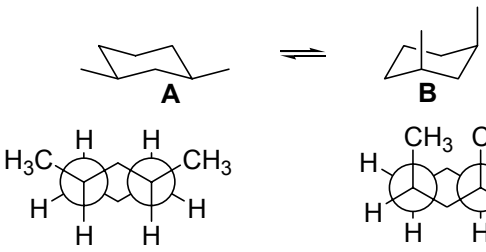
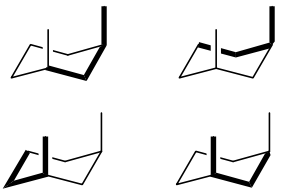
4.

Cis:



0 gauche interactions
0 X 0.9 = 0 kcal mol^{-1}

4 gauche interactions
4 X 0.9 = 3.6 kcal mol^{-1}



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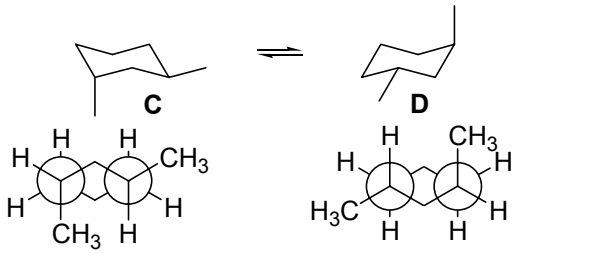

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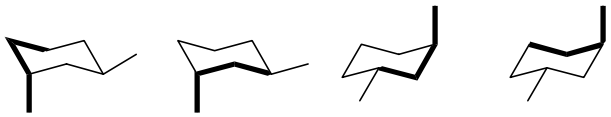
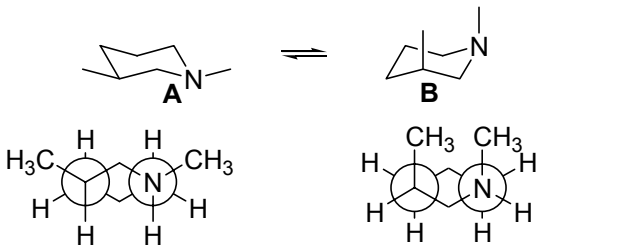


(bold indicates gauche interactions)

5.

Cis:



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0 X 0.9 = 0 kcal mol^{-1}

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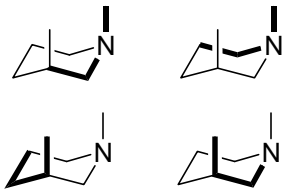

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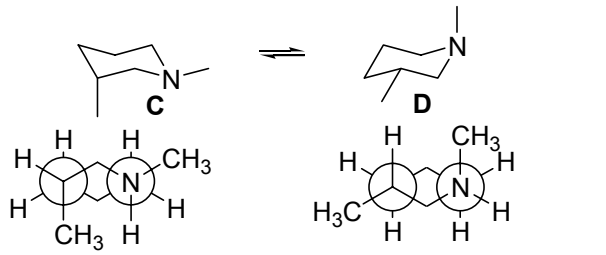

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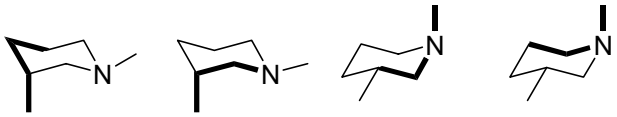

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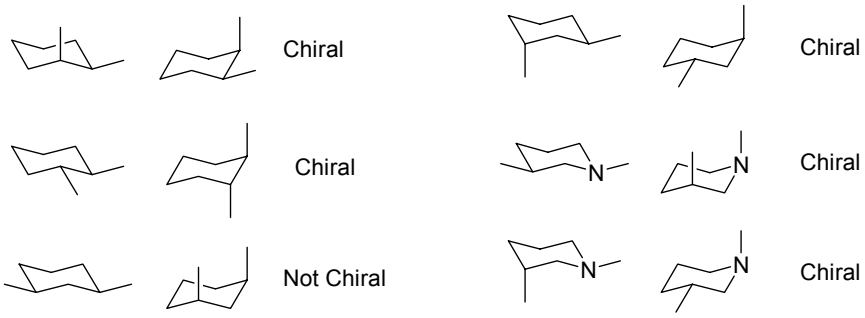
6.

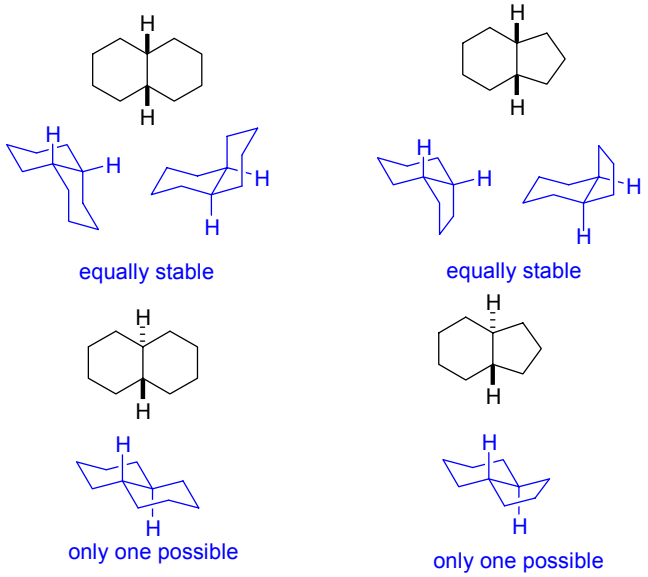


7. With the aid of molecular models determine which of the following compounds are chiral

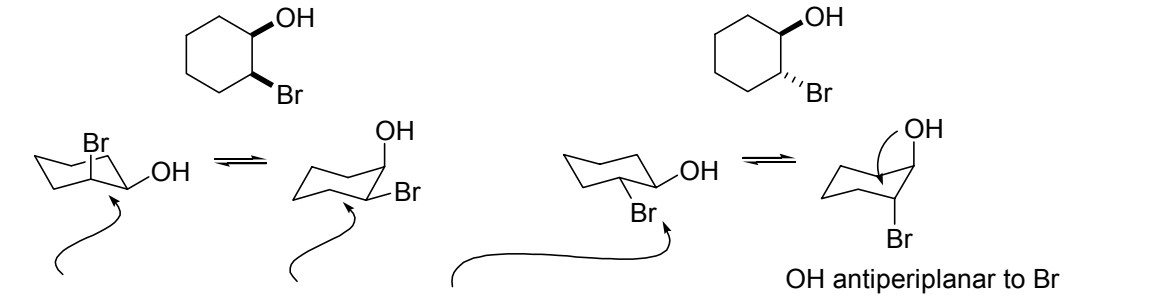
a) 2,3-pentadiene Chiral
b) 2,3,4-hexatriene Not Chiral
c) 1,4-diphenyl-2,3-dimethyl-1,3-butadiene Not Chiral

d) bicyclo[2.2.2]oct-2-ene Not Chiral
e) 1,1'-bi-2-naphthol Chiral

8. Draw the conformations of the following and indicate which are most stable.



9. In figure 1, compound **3** can react from two major conformers. Draw the conformer that is the reactive one and explain why it is the most reactive.



S_N2 reaction requires nucleophile to be antiperiplanar to leaving group