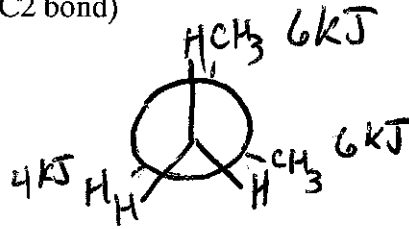
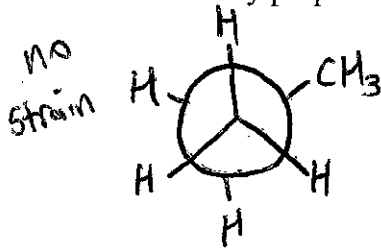


# Answer Key

## Conformational Analysis Handout

1. Draw a Newman Projection for the most and the least stable conformations of each of these compounds. Calculate the difference in energy between them, and use our thermodynamic Rule of Thumb to estimate the relative amount of each at equilibrium.

A. 2-methylpropane (C1-C2 bond)

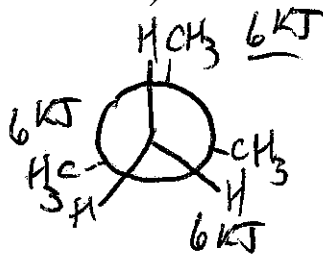
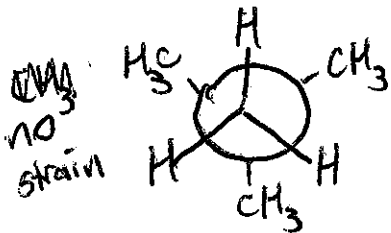


$$\Delta G \sim 16 \text{ kJ/mol}$$

Rule of Thumb:  
5.8 kJ = 10x

Relative amounts  $\sim 1 : 10^3$

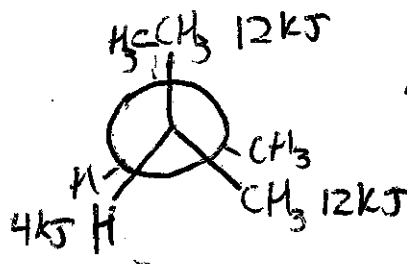
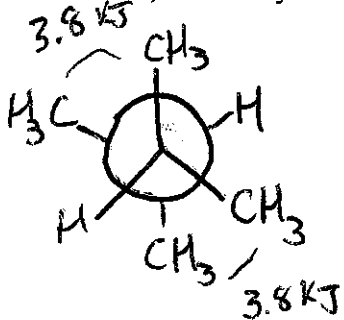
B. 2,2-dimethylpropane (C1-C2 bond)



$$\Delta G \sim 18 \text{ kJ/mol}$$

Relative amounts  $\sim 1 : 10^3$

C. 2,3-dimethylbutane (C2-C3 bond)



$$\Delta G \sim 20.4 \text{ kJ}$$

Relative amounts  $\sim 1 : 10^{3.5}$

2. Draw a relative energy diagram for the conformational analysis of 1,2-dichloroethane.

