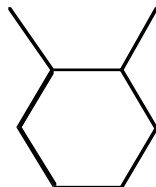


Problem 37, Chemistry 301X, 2006

(a) Draw schematic pictures of all the possible isomers of *cis*-tetramethylcyclohexane. Please note that we are requiring that the four methyl groups be *cis*. So, a schematic picture of *cis*-1,2-dimethylcyclohexane might be done as:



(b) Next, transform these schematics into PERFECT three-dimensional drawings.

(c) Finally, pick the lowest energy structure of the three, and explain in a very few words why it is the lowest.