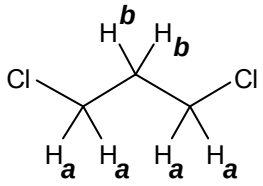
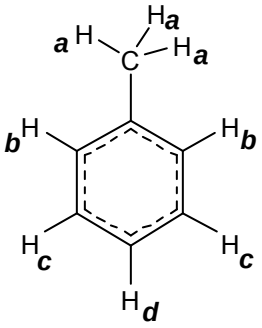
Workshop 27 Solutions
Equivalent and Inequivalent Nuclei

number of resonances

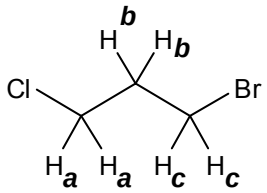


2



number of resonances

4



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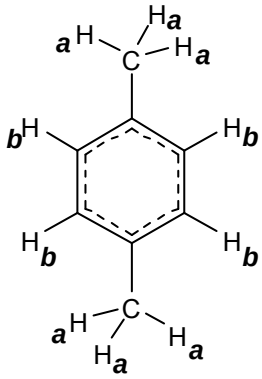
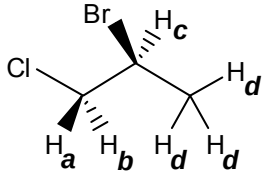
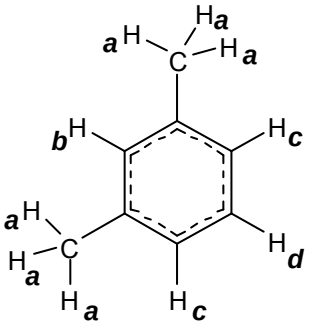


2



4

Why are H_a and H_b inequivalent? In class, I described a test used to evaluate whether two protons are inequivalent, in which each is replaced with another atom (say an "X"). If this replacement gives two different molecules, then those two H's are inequivalent. Here, replacing H_a or H_b gives diastereomers:



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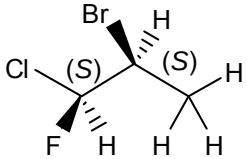

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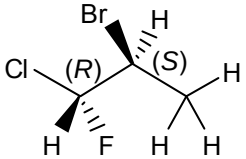

These molecules aren't the same. So, the two protons are diastereotopic, inequivalent.