**Chapter 4.**

**2021. 03. 30.**

**Problem 4-41**

Assume that you have a variety of cyclohexanes substituted in the positions indicated. Identify the substituents as either axial or equatorial. For example, a 1,2-*cis* relationship means that one substituent must be axial and one equatorial, whereas a 1,2-*trans* relationship means that both substituents are axial or both are equatorial.

|  |  |  |  |
| --- | --- | --- | --- |
| (a) | 1,3-Trans disubstituted | (b) | 1,4-Cis disubstituted |
| (c) | 1,3-Cis disubstituted | (d) | 1,5-Trans disubstituted |
| (e) | 1,5-Cis disubstituted | (f) | 1,6-Trans disubstituted |

**Problem 4-42**

Draw the two chair conformations of *cis*-1-chloro-2-methylcyclohexane. Which is more stable, and by how much?

**Problem 4-43**

Draw the two chair conformation of *trans*-1-chloro-2-methylcyclohexane. Which is more stable?

**Problem 4-4**

Galactose, a sugar related to glucose, contains a six-membered ring in which all the substituents except the –OH group, indicated below in red, are equatorial. Draw galactose in its more stable chair conformation.

