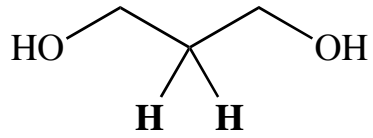
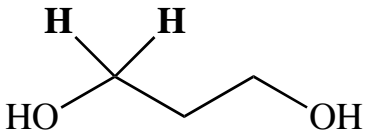
Exercise 54A - Shift Equivalence

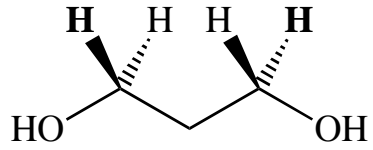
Using either the substitution test, or by symmetry properties/bond rotation, determine whether the groups or atoms shown in bold are homotopic, enantiotopic or diastereotopic. Models will help and remember, these drawings may be misleading.



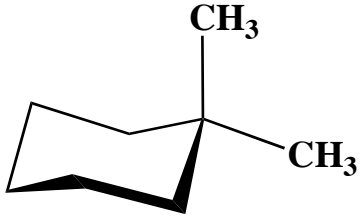
Homotopic by C2 molecular axis.



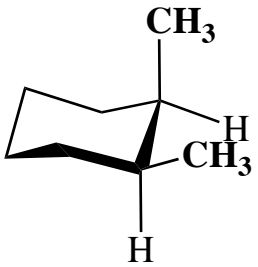
Enantiotopic by internal mirror plane.



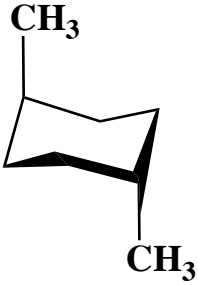
Homotopic by C2 molecular axis.



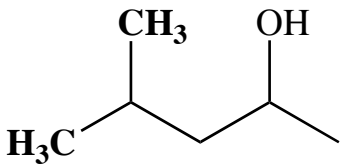
Homotopic by ring inversion (bond rotation).



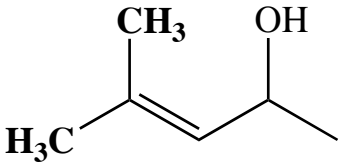
Enantiotopic by reflection in internal mirror plane (in a different conformation, but it still counts).



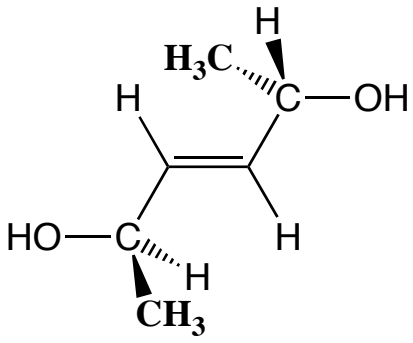
Homotopic by C2 axis.



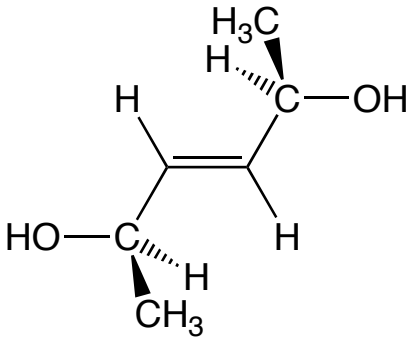
Diastereotopic due to the chiral center.



Diastereotopic (cis/trans).

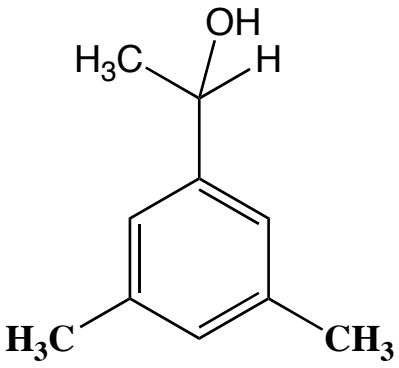


This is an example where the substitution test works best. These are enantiotopic.

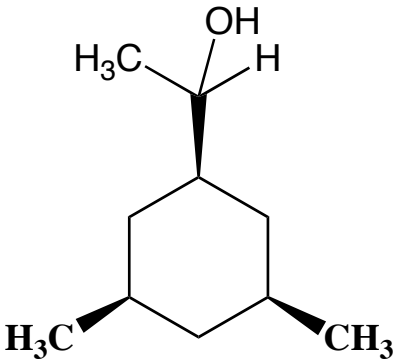


These are homotopic by C2 axis.

An important distinction...

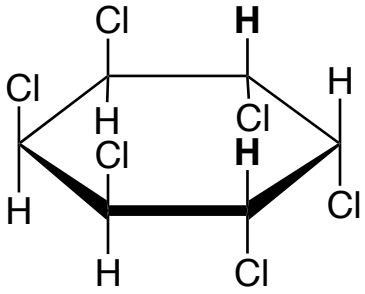


Homotopic by aryl bond rotation.

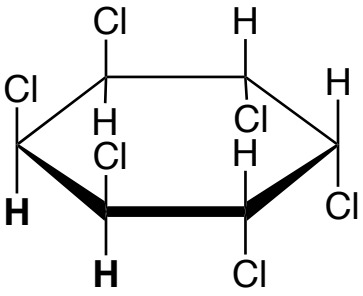


Diastereotopic due to the chiral center.

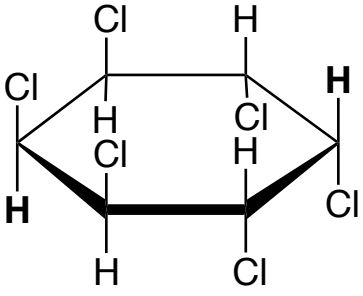
The distinction between these two is flat versus three-dimensional.



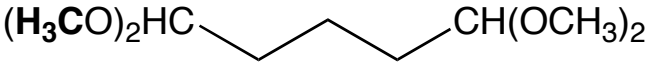
Enantiotopic by reflection.



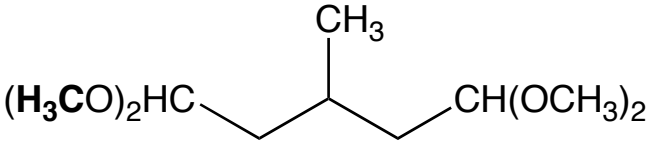
Diastereotopic.



Homotopic by C2.



Enantiotopic by reflection.



Diastereotopic.