

Chemistry 333
Organic Lab Lecture

Name: ___Key_____

Exam #1

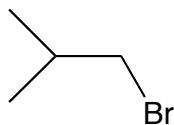
This is an open-book, open notes exam. Show your work, so you can receive credit for correct parts of the final molecule.

1. (20 points) C_4H_9Br IHD = 0

42.5, t
30.7, d
21.0, q (2)

H₃C
----- symmetry
H₃C

One branch point, so three end groups. Two are methyls, the other must be CH₂Br.



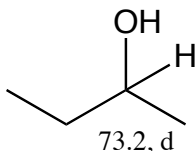
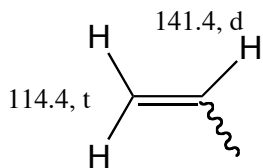
2. (40 points)



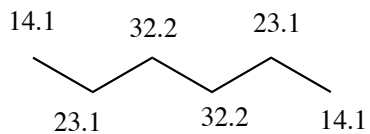
IHD = 1

There are 15 H's attached to C, so one must be attached to O

141.4, d
114.4, t
73.2, d
37.0, t
31.8, t
25.0, t
22.6, t
14.0, q

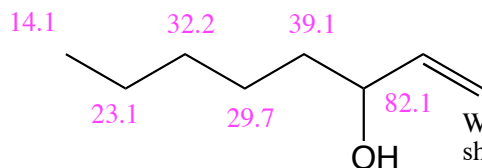


There is only one branch point, where the OH is attached. Therefore the rest of the molecule is linear.



The chemical shifts of hexane are the replicated in the data, suggesting that the alcohol is at one end of the chain, not shifting the other end.

calculated chemical shifts



With two groups alpha on the carbon, the calculated chemical shift is too high.

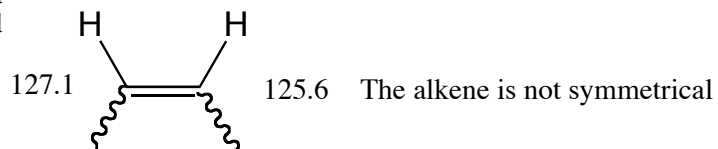
3. (40 points)

C_5H_9N

IHD = 2

127.1, d
125.6, d
45.0, t
43.1, t
25.9, t

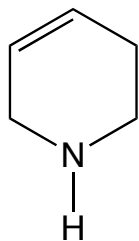
There is one H not on C, therefore on the N



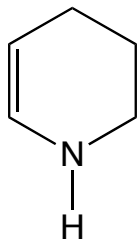
There is one ring with no branch points, so all the C's and the N have to be contained in the ring

Using generic chemical shifts, we calculate the RCH_2NH would come at about 51. We have 45.0, t and 43.1, t

Putting it all together



Why would



not fit the data?