

Department of Chemistry
University of Missouri-St. Louis

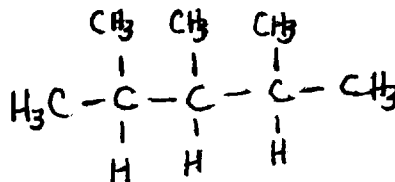
Name _____
Chem 6

November 10, 2000
Exam 3

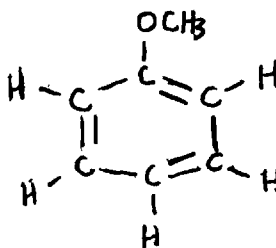
1. (24 pts)

Draw structural formulas for each of the following compounds. Please indicate all the bonds to carbon.

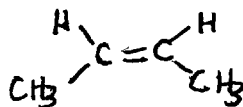
a. 2,3,4-trimethylpentane



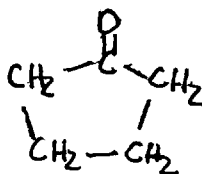
b. 3-methoxybenzene



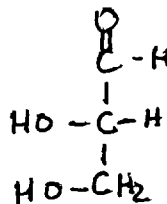
c. cis 2-butene



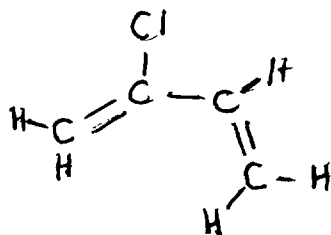
d. cyclopentanone



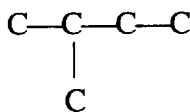
e. 2,3-dihydroxypropanal



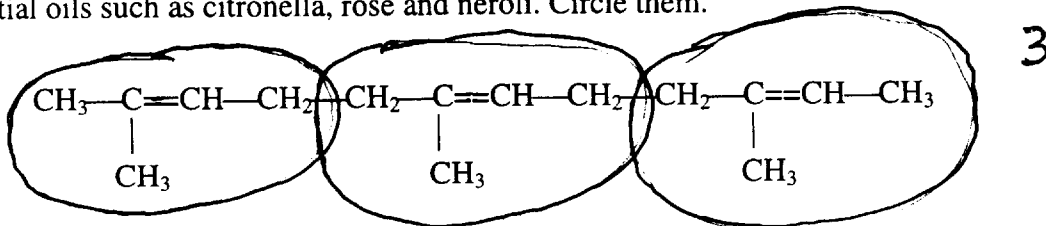
f. 2-chloro-1,3-butadiene



3.(8 pts) The following carbon backbone is a fundamental building block of nature:

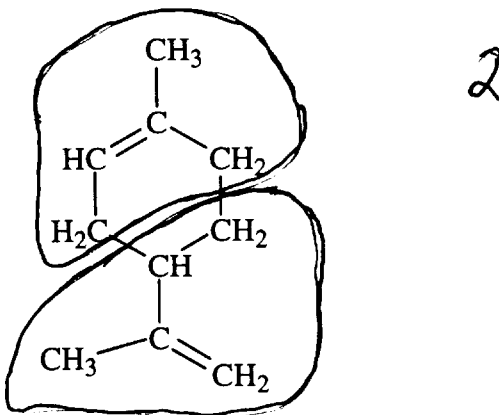


a. How many of these units are present in the sesquiterpene, farnesol, found in many essential oils such as citronella, rose and neroli. Circle them.



farnesol

b. How many of these units are present in limonene? Circle them.



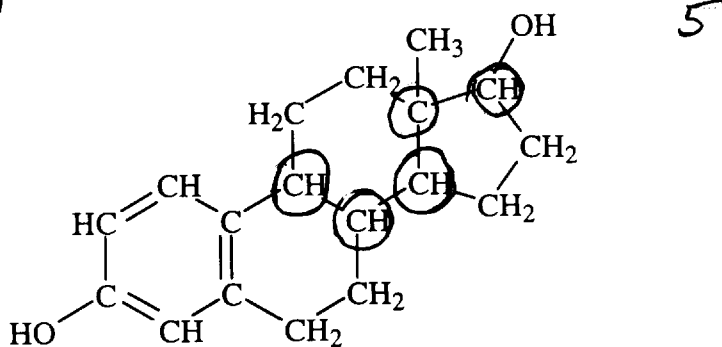
4. (10 pts) The following molecule is estradiol, an important female sex hormone.

1. Circle and name the different functional groups in the molecule. If the molecule contains more than one of these groups, you only need to identify one of them.

$-\text{OH}$, $\text{C}=\text{C}$ 2 hydroxyl groups, carbon-carbon double bonds

2. Does the molecule contain any carbon atoms with four different substituents? Circle and identify them also.

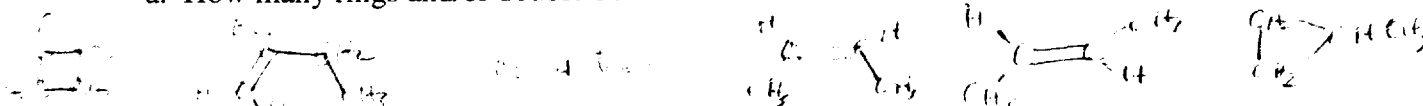
yes



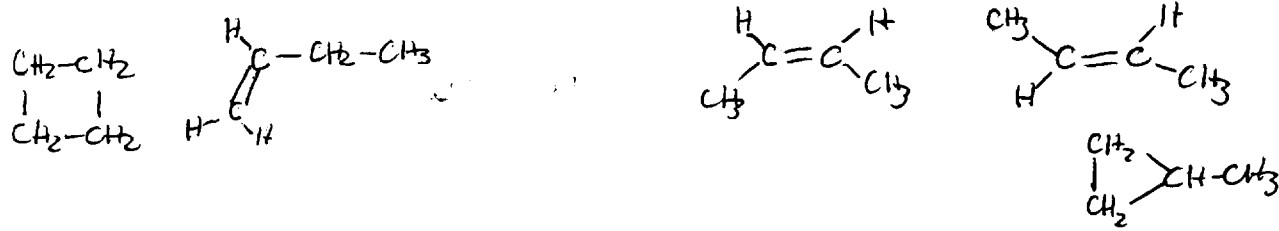
On the basis of the number of carbons having 4 different substituents in estradiol, how many different possible stereoisomers are there?

2⁵

5. (12 pts) A molecule has the molecular formula of C₄H₈.
 a. How many rings and/or double bonds does it contain?



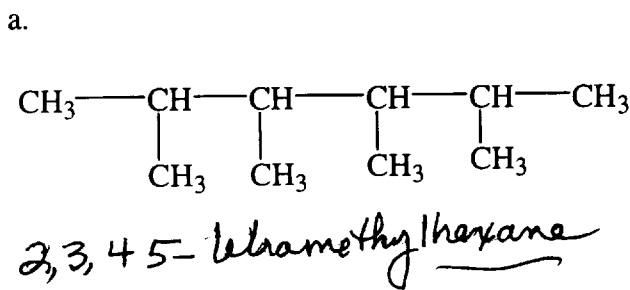
- b. Draw the structure of three different molecules with this molecular formula. Be sure to indicate all the bonds to carbon.



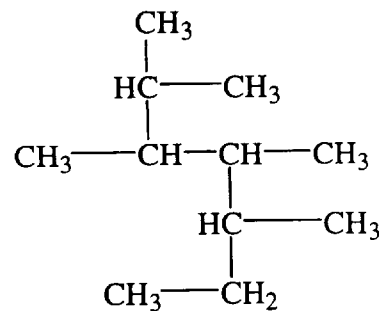
6. (9 pts) Predict in a, b and c which of the two compounds would be more soluble in water.

- a. CH₃CH₂CH₂CH₃ vs CH₃CH₂OCH₂CH₃
 b. CH₃CH₂CH₂CH₂CH₂CH₂OH vs CH₃OH
 c. CH₃CH₂CH₂C(=O)CH₃ vs CH₃CH₂CH₂CH₂CH₃

7. (9 pts) Classify the following pairs of molecules as either different (non-isomeric), isomeric or identical.

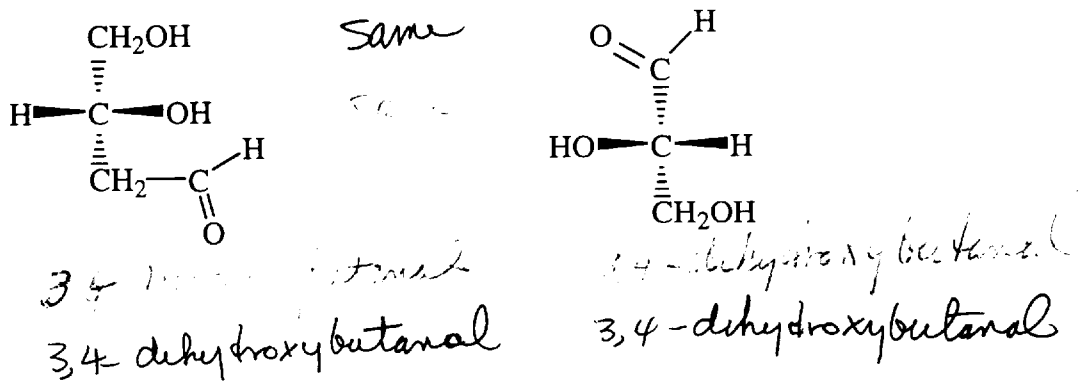


Different

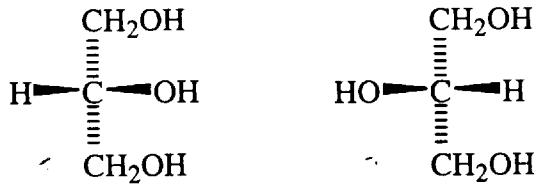


2,3,4,5-tetramethylheptane
 2,3,4,5-tetramethylheptane⁴

b.



c



1,2,3-trihydroxypropane
1,2,3-trihydroxypropane

8. (4 pts)

Draw the structure of a polymer and name it.



polyethylene
polyethene