CHEM 2410 – Principles of Organic Chemistry I – Summer 2016

Instructor: Paul Bracher

Quiz #4

Due: Sunday, June 19th, 2016

4:00 p.m. (online/Blackboard)

Student Name (Printed)	
Student Signature	

Instructions & Scoring

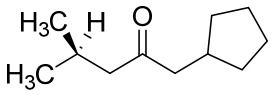
- Please post your answers to Blackboard. No answers marked in this booklet will be graded.
- You may use any resources you wish and collaborate with others.
- Any questions should be posted to the Blackboard discussion board so all students have equal access to the information.

Problem	Points Earned	Points Available
TOTAL		100

This quiz focuses on Chapters 12, 13, and 14 in Janice Smith's *Organic Chemistry*, 4th ed.

Multiple choice (100 points total; +10 points for a correct answer, +3 points for answering with the letter "E", and 0 points for an incorrect answer). For each question, select the best answer of the choices given.

(1) _____ Not counting those corresponding to solvents or reference standards, how many signals appear in the ^{13}C NMR spectrum for compound **A**?



A

(A) seven or fewer
(B) eight
(C) nine
(D) ten or more

(2) _____ Which isomer of C_4H_8O will give rise to the signal in an ^1H NMR spectrum that is the farthest downfield?

(A) (B) (C) (D)

(3) _____ An unknown compound has a molecular ion peak in its mass spectrum split into m/z 210:212:214 with relative intensities of 18:24:6. Which of the following statements is most likely to be true of the compound?

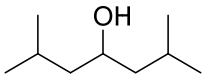
(A) it has one bromine atom and one chlorine atom
(B) it has two chlorine atoms
(C) it has two bromine atoms
(D) it has three bromine atoms

(4) _____ How many <u>sets</u> of inequivalent protons contribute to the ^{1}H NMR spectrum of compound **B**? Note that a set can contain as few as one proton, so long as it is magnetically inequivalent from the others.

B

(A) three
(B) four
(C) five
(D) six

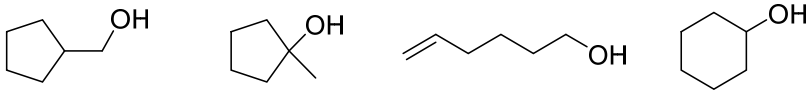
(5) _____ Of the four peaks listed below, which would you expect to have the greatest intensity in the mass spectrum of compound **C**?



C

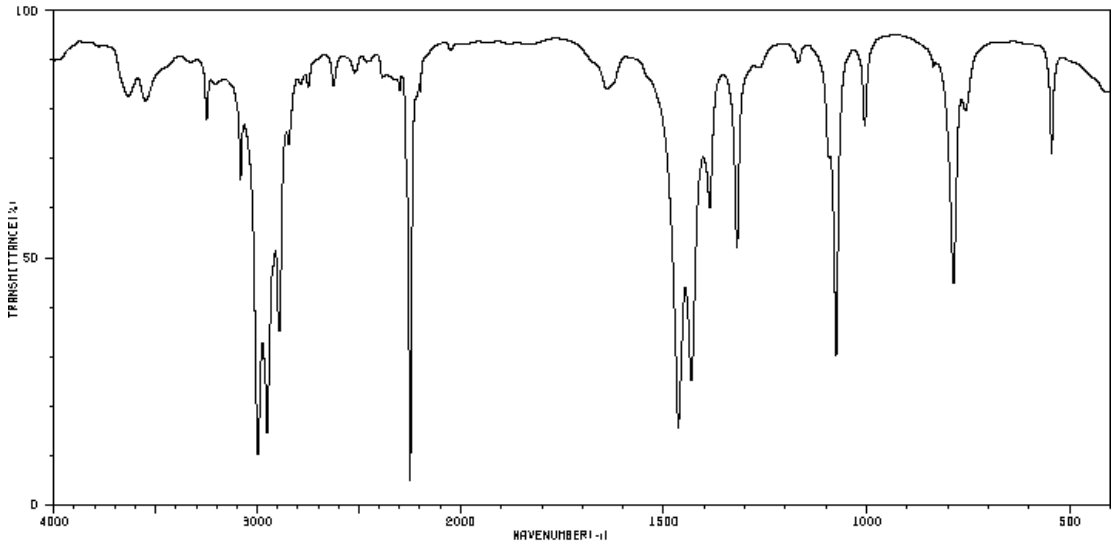
(A) m/z 15
(B) m/z 43
(C) m/z 87
(D) m/z 145

(6) _____ Which of the following isomers of $C_6H_{12}O$ will <u>not</u> be oxidized by pyridinium chlorochromate?

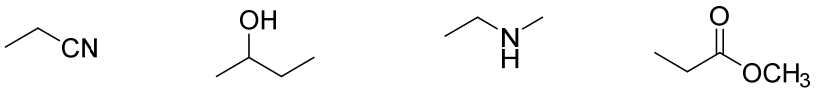


(A) (B) (C) (D)

(7) _____ Which of the following compounds is consistent with the following IR spectrum?



Source: Spectral Database for Organic Compounds, #957
http://sdbs.db.aist.go.jp/

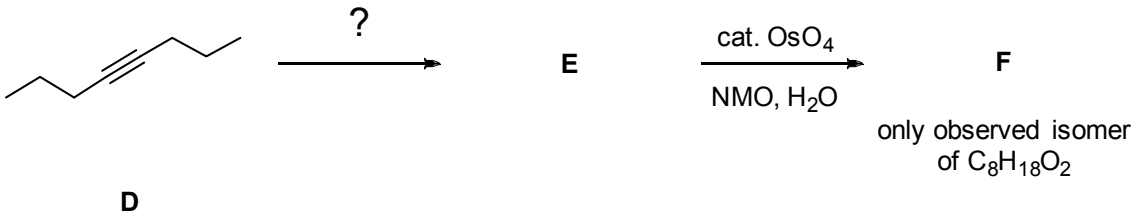


(A) (B) (C) (D)

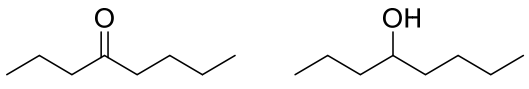
(8) _____ Which of the following compounds is <u>least</u> likely to be found in the reaction mixture when 2-hexyne is treated with one equivalent of H_2 in the presence of a catalytic quantity of palladium on carbon (Pd-C)?

(A) (*E*)-2-hexene
(B) (*Z*)-2-hexene
(C) 2-hexyne
(D) hexane

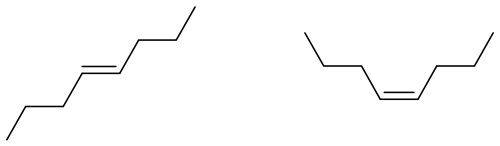
For questions 9 and 10, refer to the following reaction scheme, in which compound **D** is converted to compound **E**, which in turn is subjected to the Upjohn dihydroxylation to produce one isomer of $C_8H_{18}O_2$ as the major product, in excellent yield.



(9) _____ Which of the following is compound **E**?



(A) (B)



(C) (D)

(10) _____ What reagent(s) are required for the conversion of **D** to **E**?

(A) H_2, Lindlar catalyst
(B) Na / NH_3
(C) PCC
(D) 1. $LiAlH_4$; 2. H_2O