

CHEM 2410 – Principles of Organic Chemistry I – Summer 2016

Instructor: Paul Bracher

Quiz #2Due: Sunday, June 5th, 2016

12:00 p.m. (online/Blackboard)

| | |
|------------------------|--|
| Student Name (Printed) | |
| Student Signature | |

Instructions & Scoring

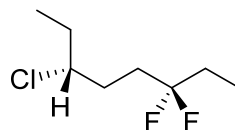
- Please post your answers to Blackboard. No answers marked in this booklet will be graded.
- You may use any resources you wish and collaborate with others.
- Any questions should be posted to the Blackboard discussion board so all students have equal access to the information.

| Problem | Points Earned | Points Available |
|---------|---------------|------------------|
| TOTAL | | 100 |

This quiz focuses on Chapters 5 through 8 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.

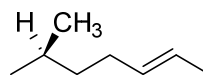
(1) _____ What is the systematic name of compound **A**?



A

- (A) (*S*)-3-chloro-6,6-difluorooctane
- (B) (*R*)-3-chloro-6,6-difluorooctane
- (C) (*S*)-6-chloro-3,3-difluorooctane
- (D) (*R*)-6-chloro-3,3-difluorooctane

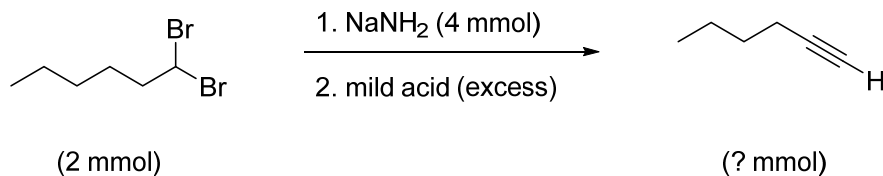
(2) _____ What statement best describes compound **B**?



B

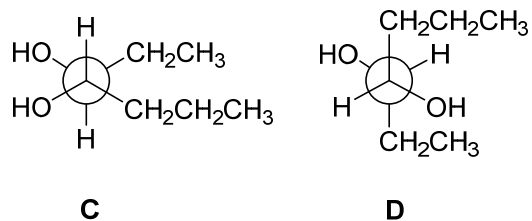
- (A) compound **B** is chiral and has at least one stereoisomer
- (B) compound **B** is chiral and has no stereoisomers
- (C) compound **B** is achiral and has at least one stereoisomer
- (D) compound **B** is achiral and has no stereoisomers

(3) _____ What is the theoretical yield of alkyne formed in the following reaction?

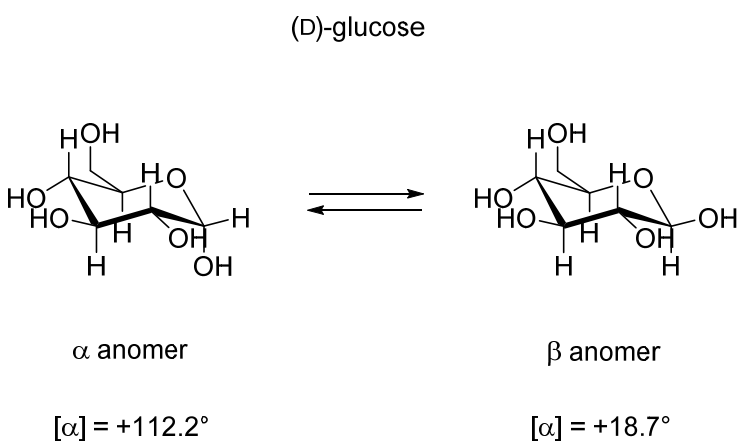


- (A) 1 mmol
- (B) 1.5 mmol
- (C) 2 mmol
- (D) 3 mmol

- (4) _____ What term best describes the relationship of the molecules represented below as Newman projections **C** and **D**?

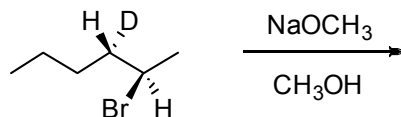
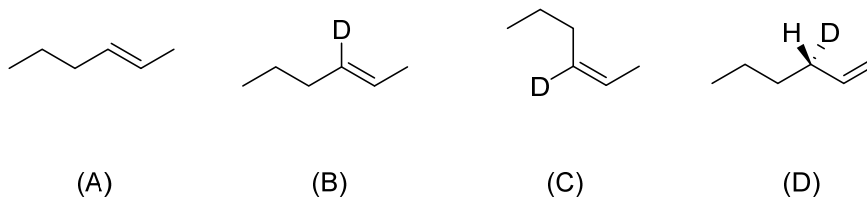


- (A) enantiomers
 (B) diastereomers
 (C) identical compounds
 (D) structural/constitutional isomers
- (5) _____ In water, glucose isomerizes between the two anomeric structures shown below. The specific rotation of a 10% (by mass) solution of the α -anomer in water at 20 °C is +112.2° per decimeter. The specific rotation of a 10% (by mass) solution of the β -anomer in water at 20 °C is +18.7° per decimeter. If a 10% (by mass) sample of glucose at equilibrium rotates light 52.7° clockwise over a 10 cm pathlength, which of the following values is closest to the ratio of the two isomers, α/β , at equilibrium?

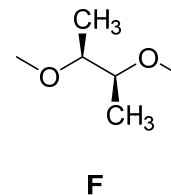
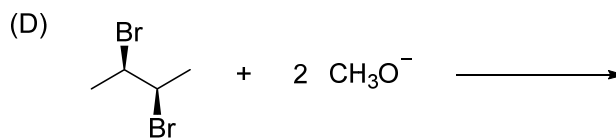
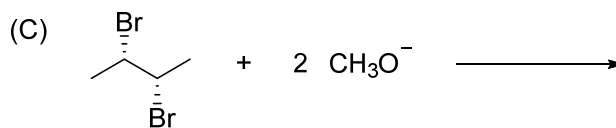
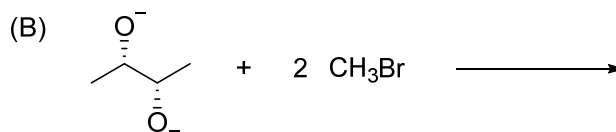
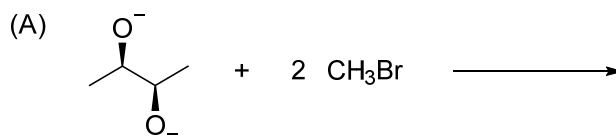


- (A) 2.04
 (B) 1.75
 (C) 0.57
 (D) 0.40

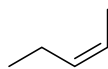
- (6) _____ What is the major product when compound **E** is treated with sodium methoxide in methanol?

**E**

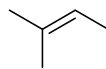
- (7) _____ Which of the following pairs of nucleophiles and electrophiles is the best choice for synthesizing (*S,S*)-2,3-dimethoxybutane (**F**)?



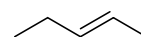
- (8) _____ Which of the following isomers of C_5H_{10} will have the most exothermic heat of combustion? That is, if one mole of each compound is burned (completely) in an oxygen atmosphere, which will release the most heat?



(A)



(B)

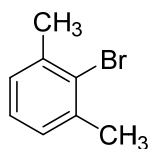


(C)

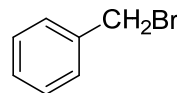
- (9) _____ Which of the following compounds can participate in exactly one of the S_N1 , S_N2 , E1, or E2 mechanisms? That is, which substrate can react in one of these reactions but none of the other three?



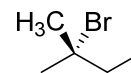
(A)



(B)

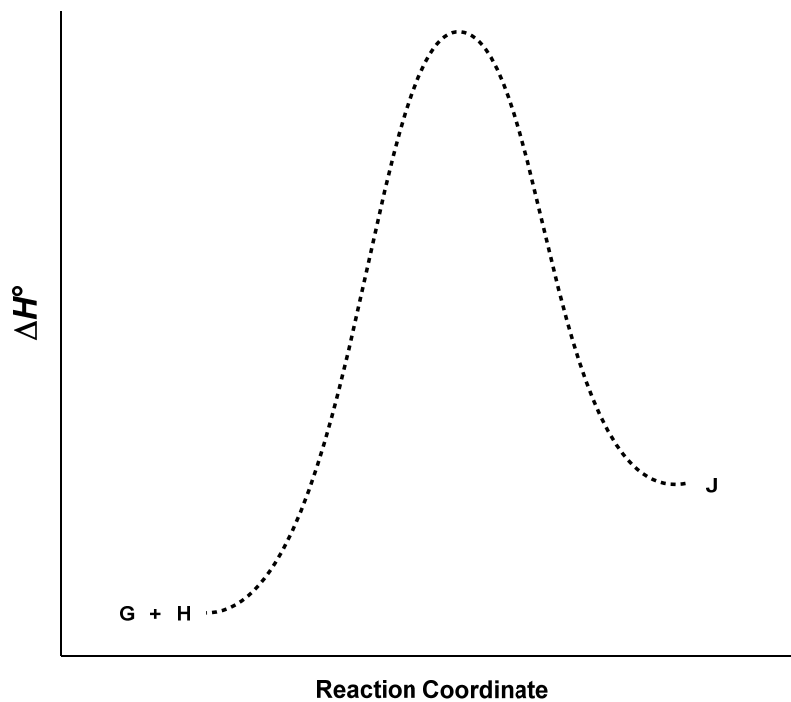


(C)



(D)

- (10) _____ Which of the following statements is not true of a reaction that corresponds to the following energy diagram?



- (A) the reaction is endothermic
- (B) the equilibrium will favor the reactants (**G & H**)
- (C) the rate of the reaction will decrease at higher temperatures
- (D) the reaction is concerted