

Last Name	First Name	MI
Student ID Number:		Total Score
Circle the name of your TA: Cari / Phil / Adam / Heather		
Discussion Section – Day:	Time:	/ 30

Chem 30A Fall 2004

QUIZ #3 KEY (15 Min)

Weds Dec 8th

**INTERPRETATION OF THE QUESTIONS IS PART
OF THE EXAM – DO NOT ASK FOR THE
QUESTIONS TO BE EXPLAINED TO YOU**

*****DO NOT OPEN THIS EXAM UNTIL INSTRUCTED TO DO SO*****

ONLY ONE QUESTION ON THIS EXAM WILL BE GRADED

BY PLACING AN 'X' IN THE APPROPRIATE BOX BELOW, INDICATE
WHICH QUESTION YOU WOULD LIKE US TO GRADE

Q1	
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Q2	
-----------	--

(IF NO BOX IS MARKED, WE WILL GRADE Q1)

(IF BOTH BOXES ARE MARKED, WE WILL GRADE Q1)

(IF IT IS AMBIGUOUS WHICH BOX IS MARKED, WE WILL GRADE Q1)

*Moe: So this was all a scam. And on Christmas.
Barney: Yeah... Jesus must be spinning in his grave!
-- The Simpsons: "Miracle on Evergreen Terrace"*

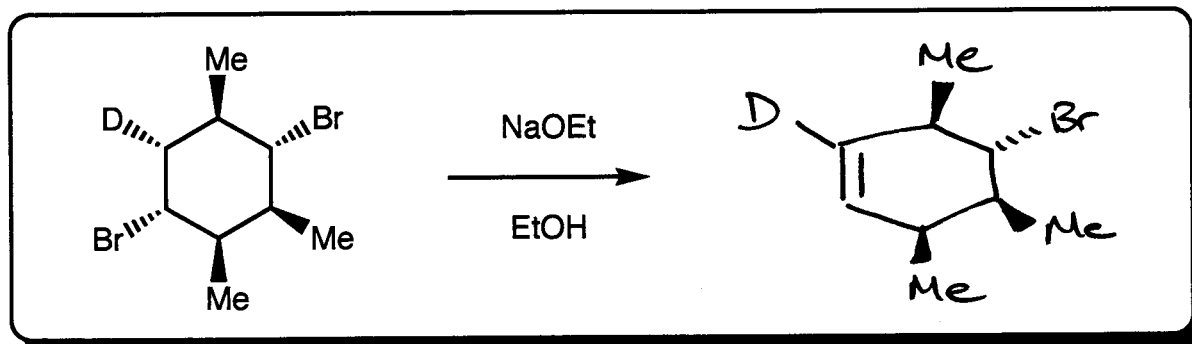
Yellow-ISH

Q1: Answer the questions below by circling either True or False (2 points each) –

- | | | |
|---|---------------------------------------|--|
| a. Dimethyl sulfoxide (DMSO) is a less polar solvent than water. | <input checked="" type="radio"/> True | <input type="radio"/> False |
| b. The E1 elimination reaction goes via a carbocation intermediate. | <input checked="" type="radio"/> True | <input type="radio"/> False |
| c. The best solvents for the S _N 2 reaction are polar protic ones. | <input type="radio"/> True | <input checked="" type="radio"/> False |
| d. Doubling the concentration of both electrophile and nucleophile in an S _N 1 reaction quadruples the rate of the reaction. | <input type="radio"/> True | <input checked="" type="radio"/> False |
| e. Tertiary alkyl halides never undergo nucleophilic substitution reactions. | <input type="radio"/> True | <input checked="" type="radio"/> False |
| f. In methanol, fluoride (F ⁻) is a better nucleophile than iodide (I ⁻). | <input type="radio"/> True | <input checked="" type="radio"/> False |
| g. The hydroxyl group (-OH) is a poorer leaving group than a mesylate group (-O-SO ₂ -CH ₃). | <input checked="" type="radio"/> True | <input type="radio"/> False |
| h. S _N 2 reactions do not proceed with inversion of configuration. | <input type="radio"/> True | <input checked="" type="radio"/> False |
| i. Water (H ₂ O) is a poorer nucleophile than the hydroxide ion (OH ⁻). | <input checked="" type="radio"/> True | <input type="radio"/> False |
| j. The E2 elimination reaction requires an antiperiplanar relationship between the leaving group and the beta-H atom. | <input checked="" type="radio"/> True | <input type="radio"/> False |
| k. Benzylic carbocations are not stabilized by resonance effects. | <input type="radio"/> True | <input checked="" type="radio"/> False |
| l. There are two transition states along the energy profile of an S _N 1 reaction. | <input checked="" type="radio"/> True | <input type="radio"/> False |
| m. Hofmann elimination does not give the more-substituted alkene as the major product. | <input checked="" type="radio"/> True | <input type="radio"/> False |
| n. Primary alkyl halides do not undergo elimination reactions. | <input type="radio"/> True | <input checked="" type="radio"/> False |
| o. Skeletal rearrangements are never observed in S _N 1 and E1 reactions. | <input type="radio"/> True | <input checked="" type="radio"/> False |

BONUS QUESTION

Draw the major product of the E2 elimination reaction shown below (5 points) –



YELLOW-ISH

Q2: Answer the questions below by circling either **True** or **False** (3 points each) –
(Read the questions VERY carefully before you answer)

- | | | |
|--|---------------------------------------|--|
| a. If you add up all of the numbers from 1 to 100, the total is 5050. | <input checked="" type="radio"/> True | <input type="radio"/> False |
| b. Christopher Columbus was born in Portugal. | <input type="radio"/> True | <input checked="" type="radio"/> False |
| c. The year 2100 will not be a leap year. | <input checked="" type="radio"/> True | <input type="radio"/> False |
| d. Guy Fawkes (of the gunpowder plot) was not burned at the stake. | <input checked="" type="radio"/> True | <input type="radio"/> False |
| e. The capital city of Canada is Toronto. | <input type="radio"/> True | <input checked="" type="radio"/> False |
| f. Watson and Crick did not win the Nobel Prize in Chemistry for their work on the structure of DNA. | <input checked="" type="radio"/> True | <input type="radio"/> False |
| g. It takes approximately 28 days for the moon to rotate once about the Earth. | <input checked="" type="radio"/> True | <input type="radio"/> False |
| h. UCLA was founded in 1929. | <input type="radio"/> True | <input checked="" type="radio"/> False |
| i. The Statue of Liberty holds a torch in her left hand. | <input type="radio"/> True | <input checked="" type="radio"/> False |
| j. John F Kennedy was not the president of the USA when Neil Armstrong set foot on the moon. | <input checked="" type="radio"/> True | <input type="radio"/> False |

BONUS QUESTION

There are two elements in the periodic table that are named in honour of France, one of them, unsurprisingly, is Francium (Fr), but what is the other one (5 points)?

GALLIUM (Ga)

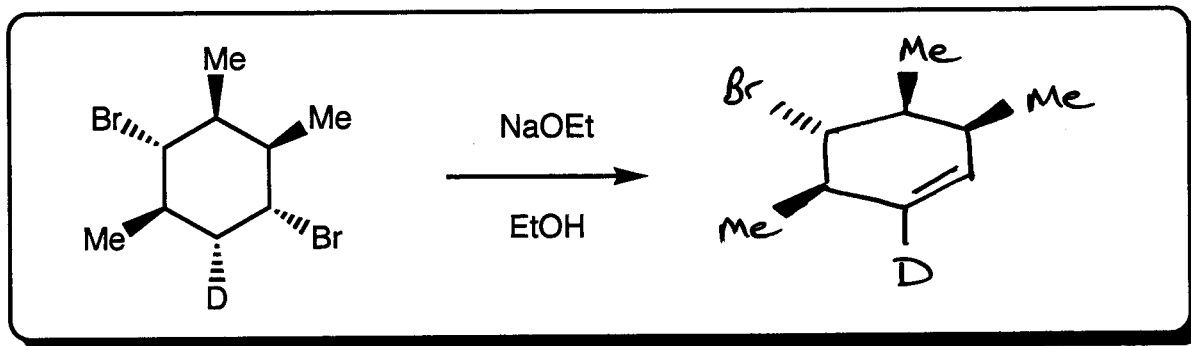
PINK

Q1: Answer the questions below by circling either True or False (2 points each) –

- | | | |
|---|------|-------|
| a. Dimethyl sulfoxide (DMSO) is a more polar solvent than water. | True | False |
| b. The E2 elimination reaction goes via a carbocation intermediate. | True | False |
| c. The best solvents for the S _N 1 reaction are polar protic ones. | True | False |
| d. Doubling the concentration of both electrophile and nucleophile in an S _N 2 reaction quadruples the rate of the reaction. | True | False |
| e. Tertiary alkyl halides never undergo nucleophilic substitution reactions. | True | False |
| f. In methanol, iodide (I ⁻) is a better nucleophile than fluoride (F ⁻). | True | False |
| g. The hydroxyl group (-OH) is a better leaving group than a mesylate group (-O-SO ₂ -CH ₃). | True | False |
| h. S _N 2 reactions proceed with inversion of configuration. | True | False |
| i. Water (H ₂ O) is a better nucleophile than the hydroxide ion (OH ⁻). | True | False |
| j. The E1 elimination reaction requires an antiperiplanar relationship between the leaving group and the beta-H atom. | True | False |
| k. Benzylic carbocations are stabilized by resonance effects. | True | False |
| l. There are two transition states along the energy profile of an S _N 2 reaction. | True | False |
| m. Hofmann elimination gives the more-substituted alkene as the major product. | True | False |
| n. Primary alkyl halides do not undergo elimination reactions. | True | False |
| o. Skeletal rearrangements are sometimes observed in S _N 1 and E1 reactions. | True | False |

BONUS QUESTION

Draw the major product of the E2 elimination reaction shown below (5 points) –



PINK

Q2: Answer the questions below by circling either True or False (3 points each) –
(Read the questions VERY carefully before you answer)

- | | | |
|--|------|-------|
| a. If you add up all of the numbers from 1 to 100, the total is 5150. | True | False |
| b. Christopher Columbus was not born in Portugal. | True | False |
| c. The year 2100 will be a leap year. | True | False |
| d. Guy Fawkes (of the gunpowder plot) was burned at the stake for his crimes. | True | False |
| e. The capital city of Canada is not Toronto. | True | False |
| f. Watson and Crick won the Nobel Prize in Chemistry for their work on the structure of DNA. | True | False |
| g. It takes approximately 28 days for the earth to rotate once about its axis. | True | False |
| h. UCLA was founded in 1919. | True | False |
| i. The Statue of Liberty holds a torch in her right hand. | True | False |
| j. John F Kennedy was president of the USA when Neil Armstrong set foot on the moon. | True | False |

BONUS QUESTION

There are two elements in the periodic table that are named in honour of France, one of them, unsurprisingly, is Francium (Fr), but what is the other one (5 points)?

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