

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

**Chem 30A Fall 2004**

**QUIZ #3 (PINK)**  
(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**

<b>Q1</b>	
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<b>Q2</b>	
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**(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)**

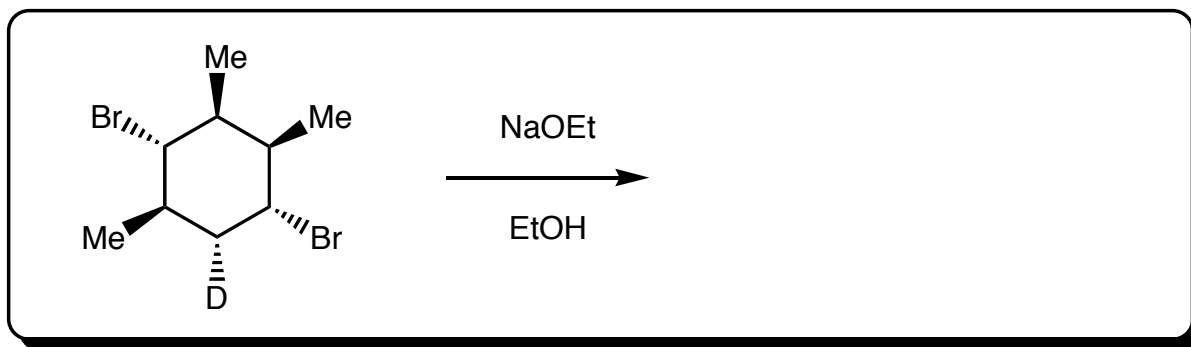
*Moe: So this was all a scam. And on Christmas.  
Barney: Yeah... Jesus must be spinning in his grave!  
-- The Simpsons: "Miracle on Evergreen Terrace"*

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

### BONUS QUESTION

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



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

### **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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**Chem 30A Fall 2004**

**QUIZ #3 (YELLOW-ISH)**  
(15 Min)

**Weds Dec 8th**

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<b>Q1</b>	
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<b>Q2</b>	
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*(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)*

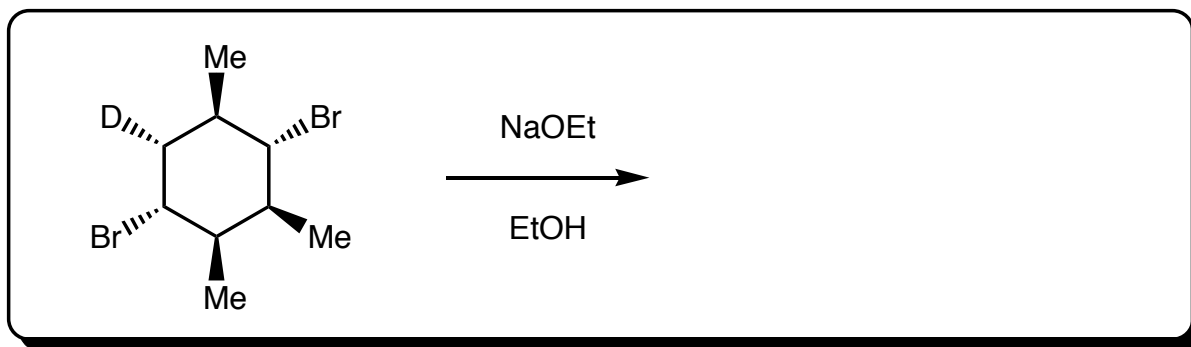
*Moe: So this was all a scam. And on Christmas.  
Barney: Yeah... Jesus must be spinning in his grave!  
-- The Simpsons: "Miracle on Evergreen Terrace"*

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

### BONUS QUESTION

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



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

### **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)?