

# Chemistry 351

## Quiz #3

September 18, 2019

Name: \_\_\_\_\_

Student Number: \_\_\_\_\_

Section Number: \_\_\_\_\_

TA: \_\_\_\_\_

### INSTRUCTIONS:

This quiz consists of 4 questions on 3 pages. Please make certain that your quiz is complete.

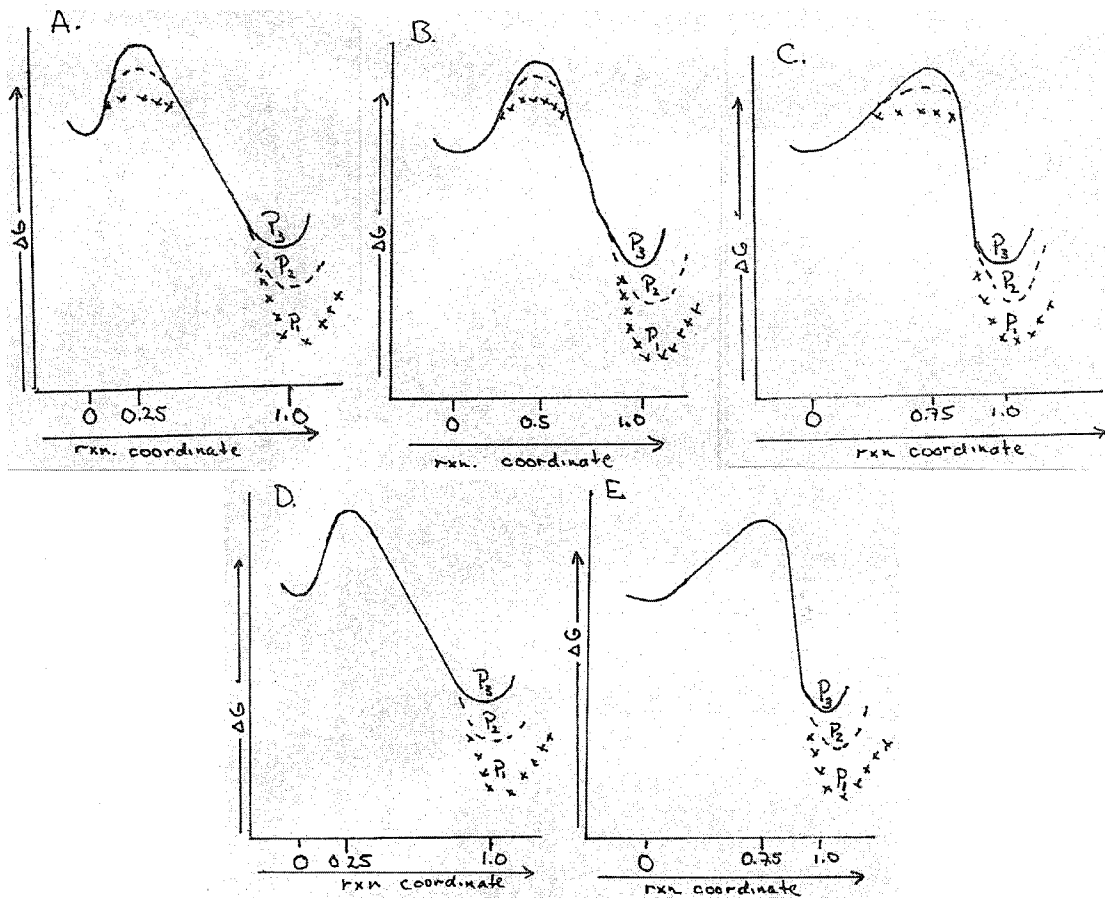
Write your name, student number, and section number **on both the quiz and answer sheet. Be certain to bubble in your PID digits on the answer sheet. The absence of any of these identification items will result in the deduction of 2 points from your score.**

Question 1 is worth 1 point. Question 2 is worth 2 points. Question 3 is worth 4 points. Question 4 is worth 3 points.

Write your answer to Question 1 on the enclosed answer sheet. **Write your answers to Questions 2-4 in the space provided on this quiz.**

When you complete the quiz, insert your answer sheet into your quiz and then hand both in on the bench in front of the lecture hall in the spot indicated by your section number.

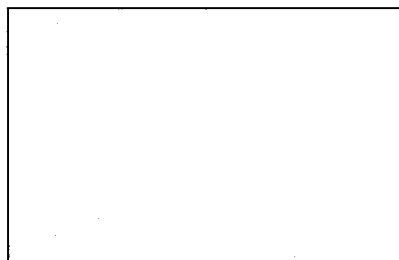
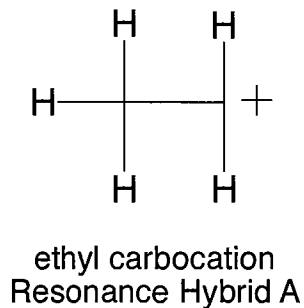
1. Three reactions having the same mechanism proceed from starting materials of identical stability to three different products. Product  $P_1$  is more stable than product  $P_2$  which is more stable than product  $P_3$ . Which of the following reaction coordinates corresponds to a reaction mechanism for these three reactions where the transition state is very product-like?



2. (2 pts)

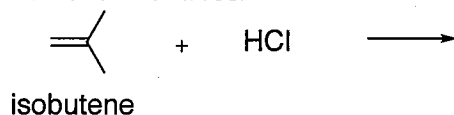
a. (1 pt) In the labeled box, provide the structure of ethyl carbocation Resonance Hybrid B that shows the hyperconjugative stabilization of ethyl carbocation Resonance Hybrid A.

b. (1 pt) Draw one arrow that shows the flow of electrons during hyperconjugative stabilization of ethyl carbocation Resonance Hybrid A leading to ethyl carbocation Resonance Hybrid B.

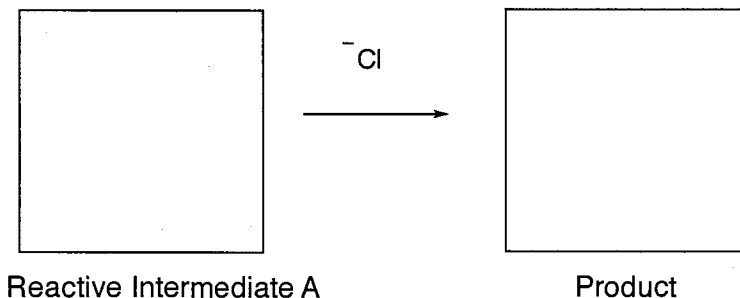
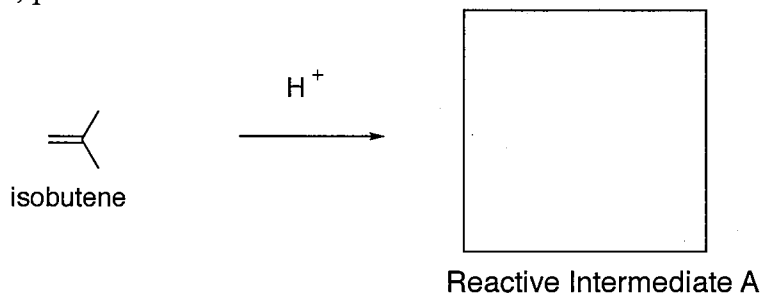


ethyl carbocation  
Resonance Hybrid B

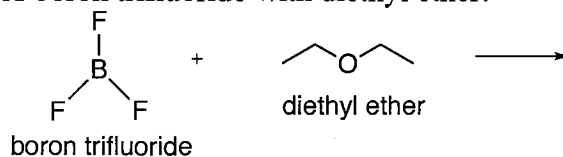
3. (4 pts) For the reaction of isobutene with HCl:



- In the space provided below, draw one arrow to show the flow of electrons during reaction of the proton with isobutene.
- In the labeled box, provide the structure of Reactive Intermediate A.
- In the space provided below, draw one arrow to show the flow of electrons during reaction of chloride with Reactive Intermediate A.
- In the labeled box, provide the Product structure.



4. (3 pts) For the reaction of boron trifluoride with diethyl ether:



- In the appropriate labeled boxes, provide the structures of the Lewis Acid and the Lewis Base.
- In the space provided below, draw one arrow that shows the flow of electrons during the reaction of boron trifluoride with diethyl ether.
- In the labeled box, provide the structure of the Product formed.

