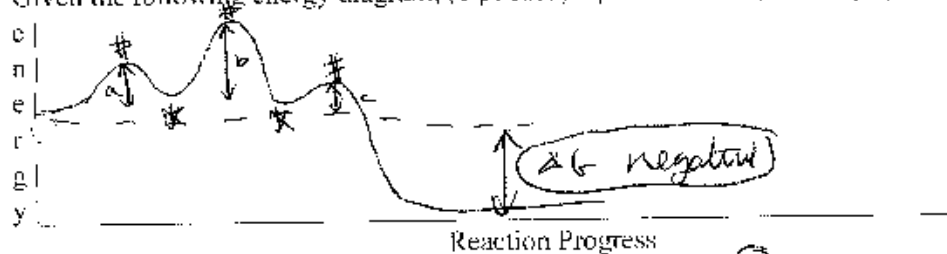


Show work on all questions for partial credit even on questions which do not specify show work. (25 total pts)  
(usually **circle one** refers to circle one **parenthesis**)

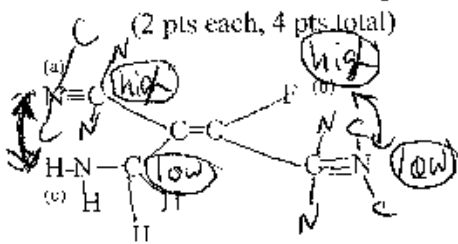
1. Given the following energy diagram, (1 pt each, 2 pts for letter e, total 6 pts)



**b is biggest Ea**  
slowest

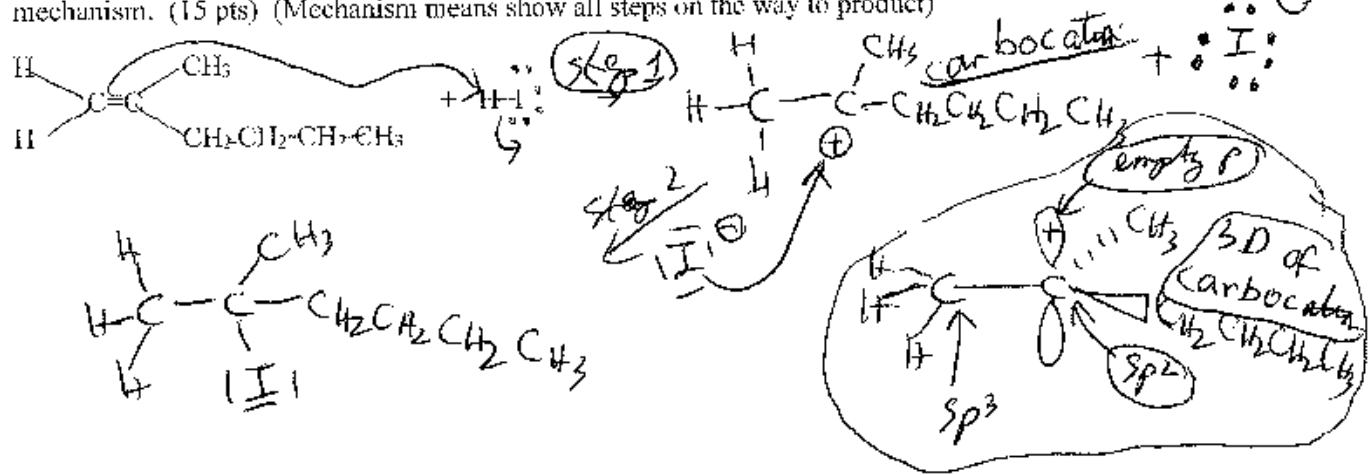
- a) How many steps is in the reaction mechanism shown [(1), (2), (3), (4)] (circle one) **(3)**
- b) Which of the steps is the slowest step [(1<sup>st</sup> step), (2<sup>nd</sup> step), (3<sup>rd</sup> step)] (circle one) (note: just because 1 gave 3 potential steps does not necessarily mean that there are actually 3 steps it could be less) **(2<sup>nd</sup> step)**
- c) How many intermediates? [(1), (2), (3), (4)] (circle one) **(2)** *\* intermediates*
- d) How many transition states [(1), (2), (3), (4)] (circle one) **(3)** *# transition states*
- e) Is the reaction energetically favored to go forward to product? [(yes), (no)] (circle one) (2 pts) **(yes)** *downhill*

3. a. Given the following alkene, to assign E/Z, do you compare (a) with [(b) or (c)] (circle one parenthesis)

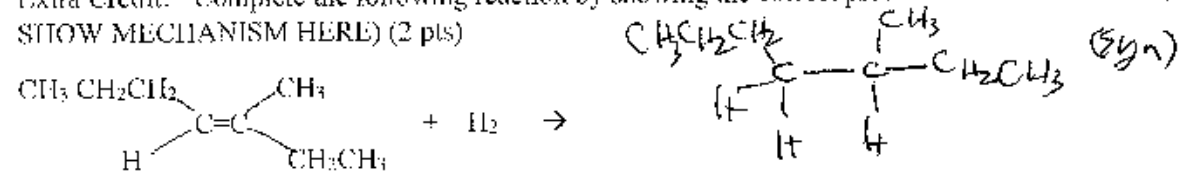


- b. Is the alkene above [(E) or (Z)] (circle one)  
Show any "ghost atoms" in the structure above.

4. Complete the following reaction mechanism. Show the intermediate but not the transition state structures. Show electron pushing arrows & Lewis Dot (or Kekule) structures for each step of the reaction mechanism. (15 pts) (Mechanism means show all steps on the way to product)



Extra Credit: Complete the following reaction by showing the correct product structural formula. (DO NOT SHOW MECHANISM HERE) (2 pts)

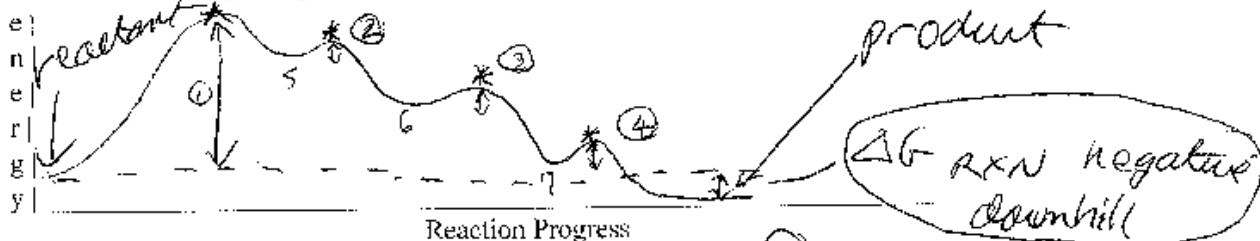


Sign Name \_\_\_\_\_ Print Name key

Show work on all questions for partial credit even on questions which do not specify show work. (25 total pts)  
(usually **circle one** refers to circle one **parenthesis**)

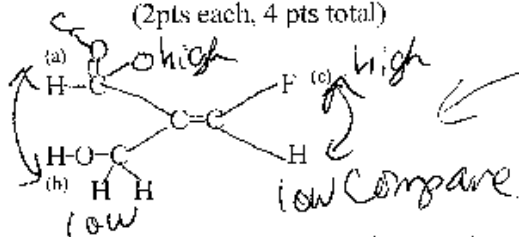
color

1. Given the following energy diagram, (1 pt each, 2 pts for letter c, total 6 pts)



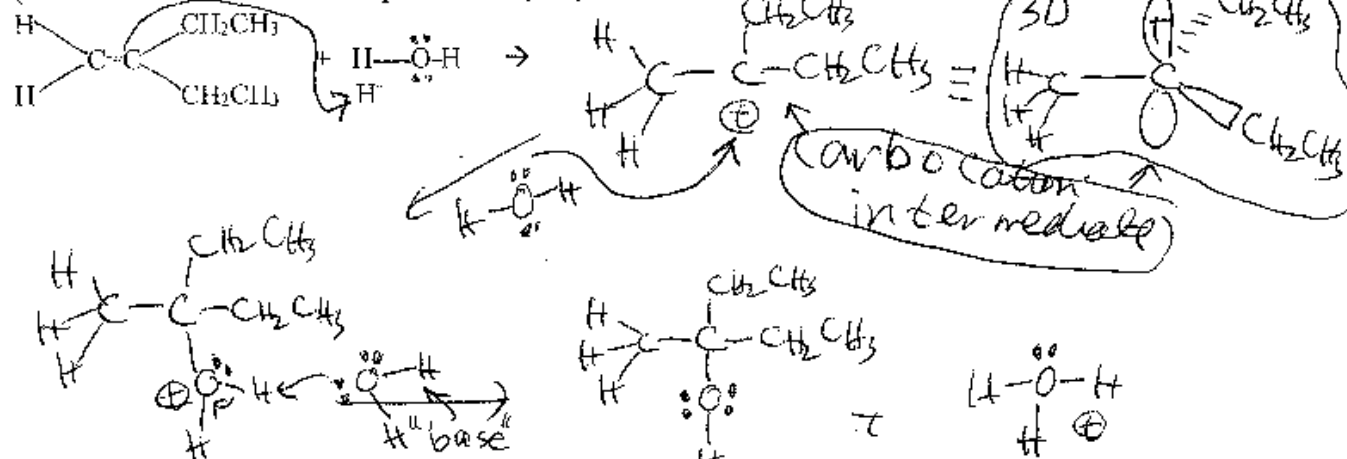
- a) How many steps is in the reaction mechanism shown [(1),(2),(3)(4)] (circle one)  
 b) Which of the steps is the slowest step [(1<sup>st</sup> step) (2<sup>nd</sup> step) (3<sup>rd</sup> step)] (circle one) (note: just because I gave 3 potential steps does not necessarily mean that there are actually 3 steps - it could be less)  $E_a(1)$  is biggest  
 c) How many intermediates? [(1),(2),(3)(4)] (circle one) (5, 6, 7 are intermediates)  
 d) How many transition states [(1),(2),(3)(4)] (circle one) \*are 5.  
 e) Is the reaction energetically favored to go forward to product? (yes) (no) (circle one) (2 pts)  
*rxn goes downhill between reactant + product*

2. a. Given the following alkene, to assign E/Z, do you compare (a) with (b) or (c) (circle one parenthesis)  
 (2pts each, 4 pts total)

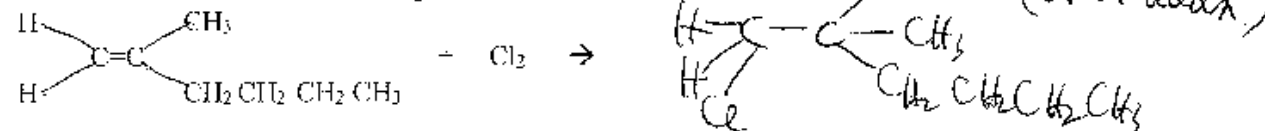


- b. Is the alkene above (E) or (Z) (circle one) Show any "ghost atoms" in the structure above.

3. Complete the following reaction mechanism. Show the intermediate but not the transition state structures. Show electron pushing arrows & Lewis Dot (or Kekule) structures for each step. (15 pts)  
 (Mechanism means show all steps on the way to product)

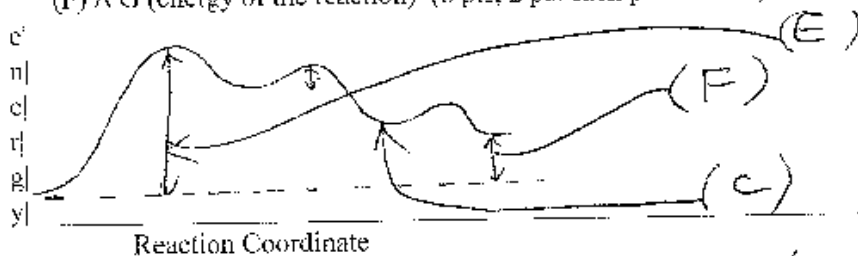


Extra Credit: Complete the following reaction by showing the correct product structural formula. (DO NOT SHOW MECHANISM HERE) (2 pts)



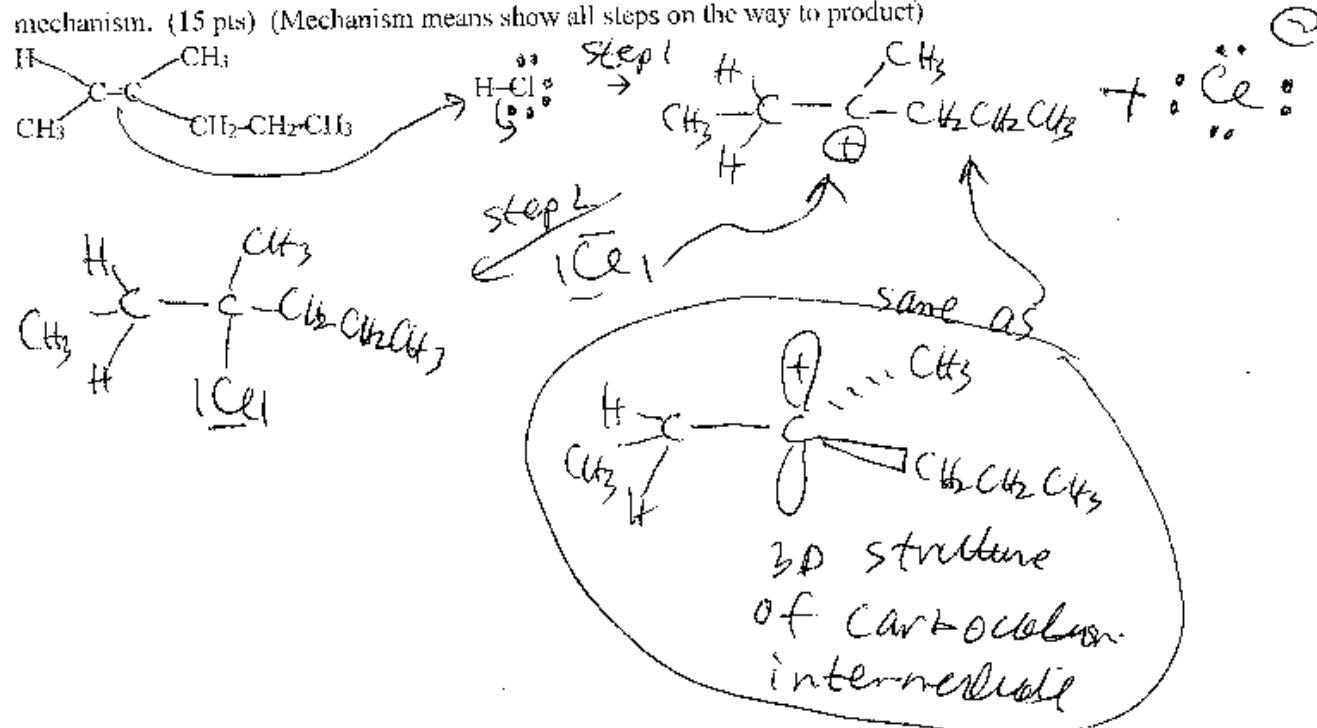
Sign Name \_\_\_\_\_ Print Name Key  
 Show work on all questions for partial credit even on questions which do not specify show work. (25 total pts)  
 (usually circle one refers to circle one parenthesis)

1. Given the following energy diagram. fill in the blank by matching the label with the following.  
 (A) reactant (B) product (C) intermediate (D) transition state (E) activation energy  
 (F)  $\Delta G$  (energy of the reaction) (6 pts, 2 pts each parenthesis)

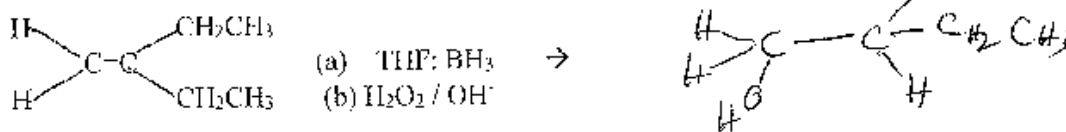


2. Name the following molecule. (4 pts) 8 - c root oct ax ene  
 $\text{CH}_3\text{CH}_2\text{C}(\text{H})=\text{C}(\text{CH}_2\text{CH}_2\text{Cl})\text{CH}_2\text{CH}_3$  chlor + meth + yl  
2-3-chloro-2-methyloct-3-ene

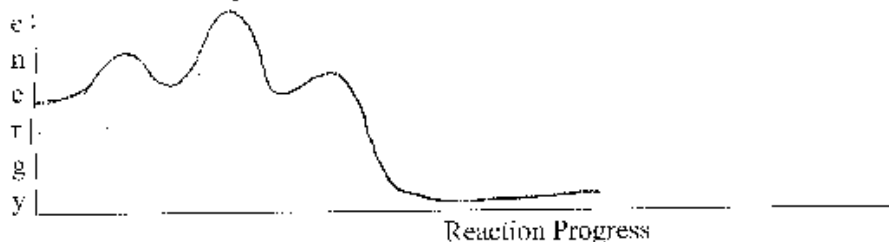
3. Complete the following reaction mechanism. Show the intermediate but not the transition state structures. Show electron pushing arrows & Lewis Dot (or Kekule) structures for each step of the reaction mechanism. (15 pts) (Mechanism means show all steps on the way to product)



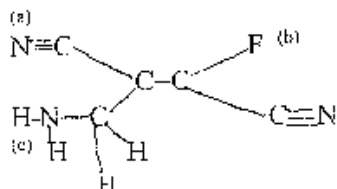
Extra Credit: Complete the following reaction by showing the correct product structural formula. (DO NOT SHOW MECHANISM HERE) (2 pts) ant: mark adds  $\text{H}_2\text{O}$



1. Given the following energy diagram, (1 pt each, 2 pts for letter e, total 6 pts)

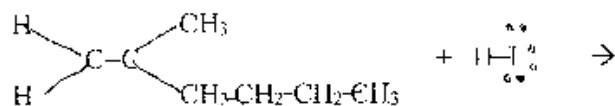


- a) How many steps is in the reaction mechanism shown [(1),(2),(3)(4)] (circle one)  
 b) Which of the steps is the slowest step [(1<sup>st</sup> step) (2<sup>nd</sup> step) (3<sup>rd</sup> step)] (circle one) (note: just because I gave 3 potential steps does not necessarily mean that there are actually 3 steps it could be less)  
 c) How many intermediates? [(1),(2),(3)(4)] (circle one)  
 d) How many transition states [(1),(2),(3)(4)] (circle one)  
 e) Is the reaction energetically favored to go forward to product? [(yes) (no)] (circle one) (2 pts)
- 3 a. Given the following alkene, to assign E/Z, do you compare (a) with [(b) or (c)](circle one parenthesis) (2 pts each, 4 pts total)

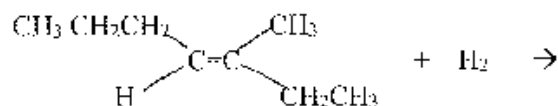


- b. Is the alkene above [(E) or (Z)]. (circle one)  
 Show any "ghost atoms" in the structure above.

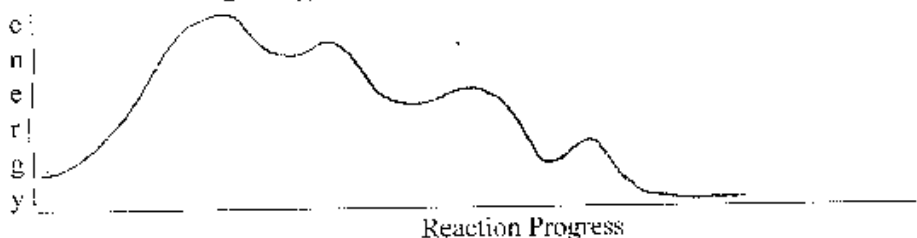
4. Complete the following reaction mechanism. Show the intermediate but not the transition state structures. Show electron pushing arrows & Lewis Dot (or Kekule) structures for each step of the reaction mechanism. (15 pts) (Mechanism means show all steps on the way to product)



Extra Credit: Complete the following reaction by showing the correct product structural formula. (DO NOT SHOW MECHANISM HERE!) (2 pts)

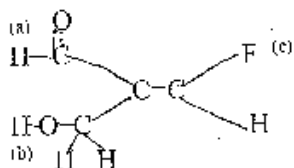


1. Given the following energy diagram, (1 pt each, 2 pts for letter e, total 6 pts)



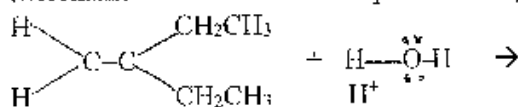
- a) How many steps is in the reaction mechanism shown [(1), (2),(3)(4)] (circle one)  
 b) Which of the steps is the slowest step [(1<sup>st</sup> step) (2<sup>nd</sup> step) (3<sup>rd</sup> step)] (circle one) (note: just because I gave 3 potential steps does not necessarily mean that there are actually 3 steps - it could be less)  
 c) How many intermediates? [(1),(2),(3)(4)] (circle one)  
 d) How many transition states [(1),(2),(3)(4)] (circle one)  
 e) Is the reaction energetically favored to go forward to product? [(yes) (no)] (circle one) (2 pts)

2. a. Given the following alkene, to assign E/Z, do you compare (a) with [(b) or (c)] (circle one parenthesis) (2pts each, 4 pts total)

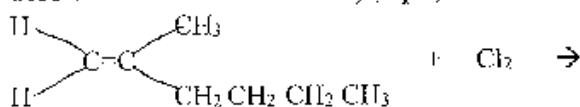


- b. Is the alkene above [(E) or (Z)]. (circle one) Show any "ghost atoms" in the structure above.

3. Complete the following reaction mechanism. Show the intermediate but not the transition state structures. Show electron pushing arrows & Lewis Dot (or Kekulé) structures for each step. (15 pts)  
 (Mechanism means show all steps on the way to product)



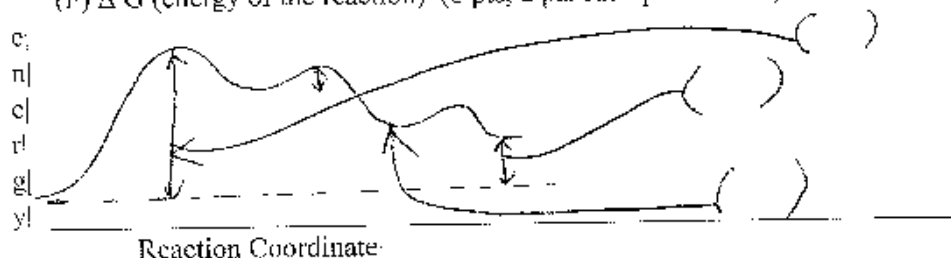
Extra Credit: Complete the following reaction by showing the correct product structural formula. (DO NOT SHOW MECHANISM HERE) (2 pts)



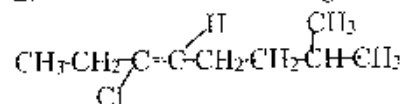
Sign Name \_\_\_\_\_ Print Name \_\_\_\_\_

Show work on all questions for partial credit even on questions which do not specify show work. (25 total pts) (usually **circle one** refers to circle one **parenthesis**)

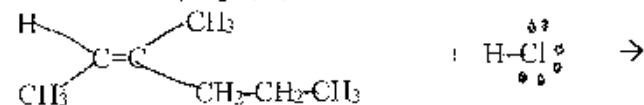
1. Given the following energy diagram, fill in the blank by matching the label with the following.  
 (A) reactant (B) product (C) intermediate (D) transition state (E) activation energy  
 (F)  $\Delta G$  (energy of the reaction) (6 pts, 2 pts each parenthesis)



2. Name the following molecule. (4 pts)



3. Complete the following reaction mechanism. Show the intermediate but not the transition state structures. Show electron pushing arrows & Lewis Dot (or Kekule) structures for each step of the reaction mechanism. (15 pts) (Mechanism means show all steps on the way to product)



Extra Credit: Complete the following reaction by showing the correct product structural formula. (DO NOT SHOW MECHANISM HERE) (2 pts)

