# Chemistry 351

## Quiz #10

## November 20, 2019

Name: _____

Student Number: _____

Section Number: _____

TA: _____

## INSTRUCTIONS:

This quiz consists of 2 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.**

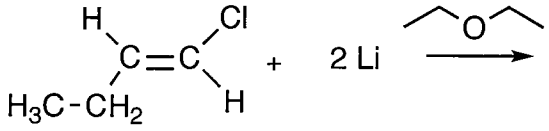
Question 1 is worth 2 points. Question 2 is worth 8 points.

**Write your answers to Questions 1 and 2 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. (2 pts)

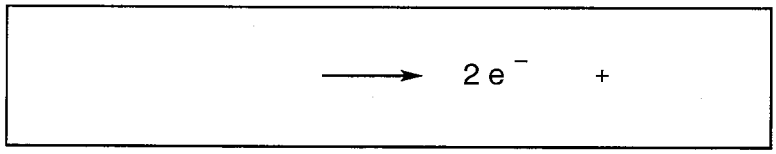
a. In the labeled boxes, provide the Product and Byproduct when one equivalent of *trans*-1-chloro-1-butene is reacted with two equivalents of Li(0).



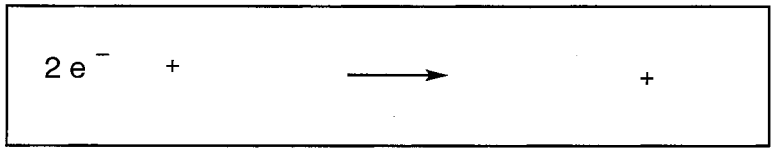

Product Byproduct

b. In the labeled boxes provide the oxidative half reaction and the reductive half reaction that result in the conversion of 1-chloro-1-butene and Li(0) into the Product and Byproduct.

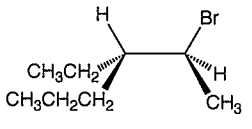
Oxidative Half Reaction



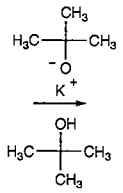

Reductive Half Reaction




2. (8 pts) (2*S*,3*S*)-2-bromo-4-ethylhexane is reacted with potassium *t*-butoxide in *t*-butanol to provide Major Product A (formed in the highest yield) via Transition State A and Minor Product B (formed in lower yield) via Transition State B.




(2*S*, 3*S*)-2-bromo-4-ethylhexane




a. Provide in the labeled box, the structure of Transition State A depicting the conformer of (2*S*,3*S*)-2-bromo-4-ethylhexane that undergoes ANTI elimination and ARROWS showing the flow of electrons during the elimination leading to Major Product A.

b. Provide in the labeled box, the structure of Major Product A.

Transition State A Major Product A

c. Provide in the labeled box, the structure of Transition State B depicting the conformer of (2*S*,3*S*)-2-bromo-4-ethylhexane that undergoes ANTI elimination and ARROWS showing the flow of electrons during the elimination leading to Minor Product B.

d. Provide in the labeled box, the structure of Minor Product B.

Transition State B

Minor Product B

e. Identify which two of the following four potential energy diagrams relates to formation of Major Product A via Transition State A and formation of Minor Product B via Transition State B by:

i) labeling the transition state corresponding to Transition State A
ii) labeling the transition state corresponding to Transition State B
iii) labeling the free energy well corresponding to Major Product A
iv) labeling the free energy well corresponding to Minor Product B