Chemistry 351

Quiz #8

October 30, 2019

Name: _____

Student Number: _____

Section Number: _____

TA: _____

INSTRUCTIONS:

This quiz consists of 7 questions on 3 pages. Please make certain that your quiz is complete.

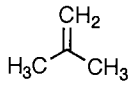
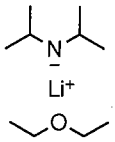
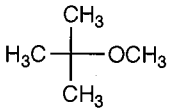
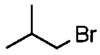
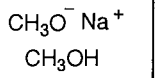
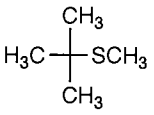
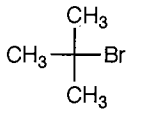
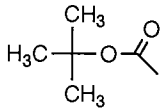
Write your name, student number, and section number **on both the quiz and answer sheet. Be certain to bubble in your PID digits on the answer sheet. The absence of any of these identification items will result in the deduction of 2 points from your score.**

Questions 1-6 are each worth 1 point. Question 7 is worth 4 points.

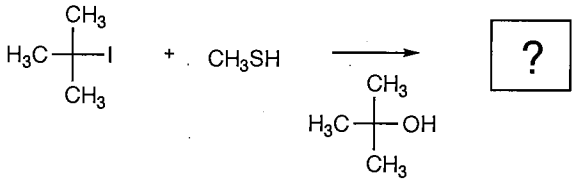
Write your answers to Questions 1-6 on the enclosed answer sheet. **Write your answers to Question 7 in the space provided on this quiz.**

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.

Questions 1-5 are to be answered from the following possibilities

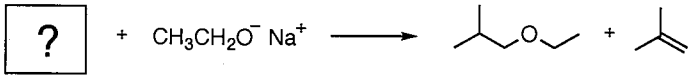
1. 	2. 	3. 	4. 	5. 
6. 	7. 	8. 	9. 	10. No Reaction

1. Identify the product(s) formed in the following reaction:



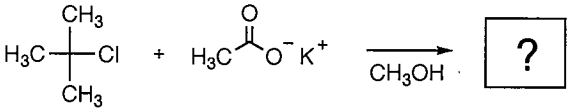
a. 2 b. 1 c. 9 d. 1,9 e. 1,4,9 f. 7 g. 8 h. 3 i. 1,7 j. 10

2, Identify the starting material in the following reaction:



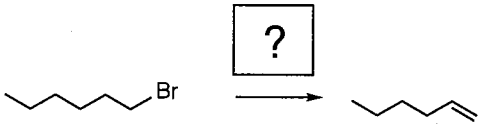
a. 2 b. 1 c. 9 d. 1,9 e. 1,4,9 f. 7 g. 8 h. 3 i. 1,7 j. 5

3. Identify the product(s) formed in the following reaction:



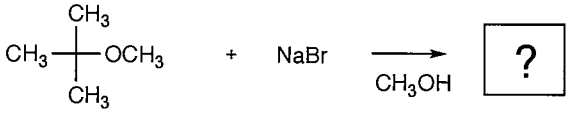
a. 2 b. 1 c. 9 d. 1,9 e. 1,4,9 f. 7 g. 8 h. 3 i. 1,7 j. 10

4. Identify the reagent and solvent required for the following reaction:



a. 2 b. 1 c. 6 d. 1,9 e. 1,4,9 f. 7 g. 8 h. 3 i. 1,7 j. 5

5. Identify the product(s) formed in the following reaction:



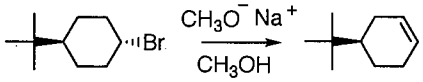
a. 2 b. 1 c. 9 d. 1,9 e. 1,4,9 f. 7 g. 8 h. 3 i. 1,7 j. 10

6. Identify which three of the following statements are correct:

1. *t*-Butanol is less acidic than water because its steric bulk/hydrophobicity interferes with solvation of the negatively charged oxygen atom in *t*-butanol's conjugate base.
2. 2,2,2-Trifluoroethanol is much more acidic than ethanol because of inductive destabilization of the negatively charged oxygen atom in 2,2,2-trifluoroethanol's conjugate base.
3. Lithium diisopropylamide is a stronger base than *n*-butyl lithium.
4. *n*-Butyl lithium is a stronger base than lithium diisopropylamide.
5. Reaction of ethanol with potassium hydride (KH) does not lead to irreversible formation of potassium ethoxide because KH is not a strong enough base to remove a proton from ethanol.
6. Reaction of ethanol with sodium metal (Na(0)) leads to formation of hydrogen gas (H_2) and irreversible formation of sodium ethoxide.

a. 1,3,5 b. 2,3,5 c. 1,4,5 d. 2,4,5 e. 1,3,6 f. 2,3,6 g. 1,4,6 h. 2,4,6

7. (4 pts total) Elimination of bromide from *trans*-1-bromo-4-*t*-butylcyclohexane promoted by sodium methoxide in methanol has a rate equation of d[substrate]dt = *k*[substrate].



(a) In the labeled box, draw the most stable chair conformer of substrate *trans*-1-bromo-4-*t*-butylcyclohexane with all substituents shown.
(b) In the labeled box, provide the structure of a reactive intermediate that precedes formation of 4-*t*-butylcyclohexene.
(c) In the labeled boxes, draw ALL arrows showing the flow of electrons during conversion of *trans*-1-bromo-4-*t*-butylcyclohexane into 4-*t*-butylcyclohexene.
(d) In the provided potential energy diagrams, CIRCLE THE SINGLE LETTER that corresponds to the position of the reactive intermediate that precedes formation of 4-*t*-butylcyclohexene.

Most StableConformer:
trans-1-bromo-4-*t*-butylcyclohexane

Reactive Intermediate