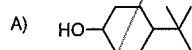
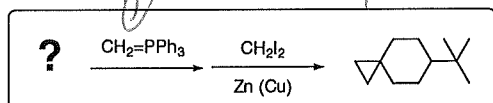


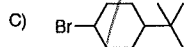
You are not allowed to post this key on the internet!

5. What is the starting material for the reaction sequence in the box?

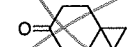
Wittig
→ ketone or aldehyde as reactant



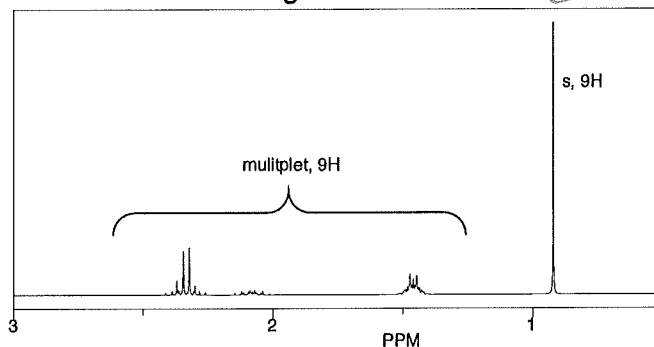
B)



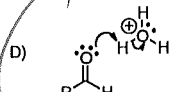
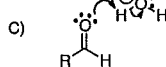
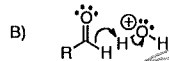
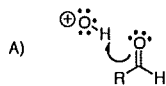
D)



¹H NMR of the starting material.



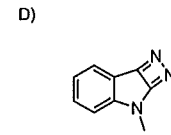
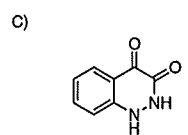
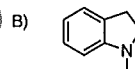
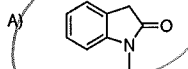
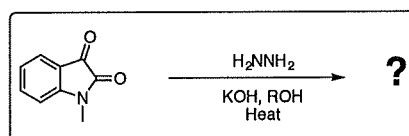
6. Which of the following drawings correctly describes the movement of electrons during the protonation of an aldehyde?



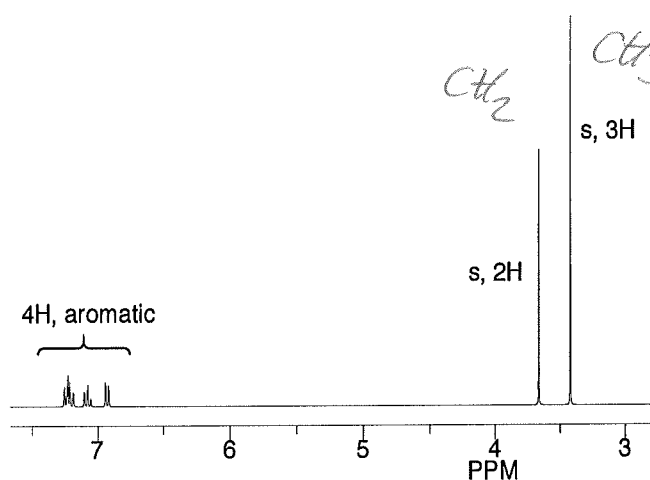
7. A key step in the reaction of formaldehyde with NaBH₄ is the nucleophilic addition of the hydride ion to the carbonyl group. What is the geometry of the resulting intermediate?

- A) trigonal planar B) tetrahedral
 C) linear D) octahedral

8. What is a major product of the reaction shown in the box?



¹H NMR of the major product:

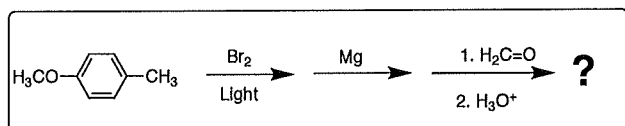


Problems 1-9 – Multiple choice please use the front of the Scantron form.

1. Which of the following gives a secondary alcohol upon reaction with NaBH_4 .

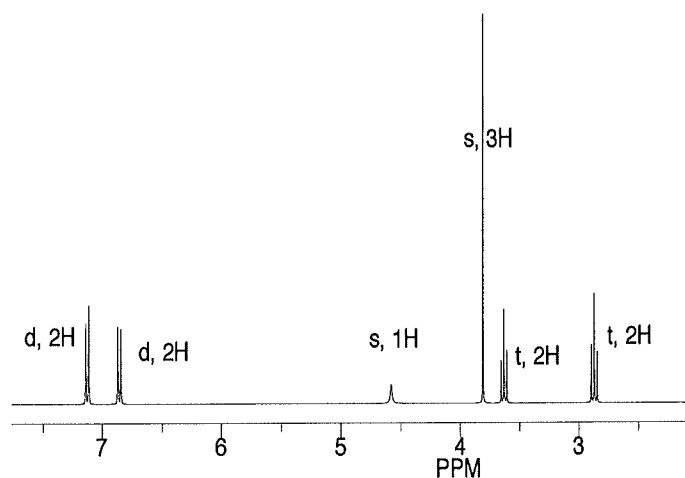
- A) formaldehyde B) acetaldehyde
 C) acetone D) benzaldehyde

2. What is a major product of the sequence of reactions shown in the box?

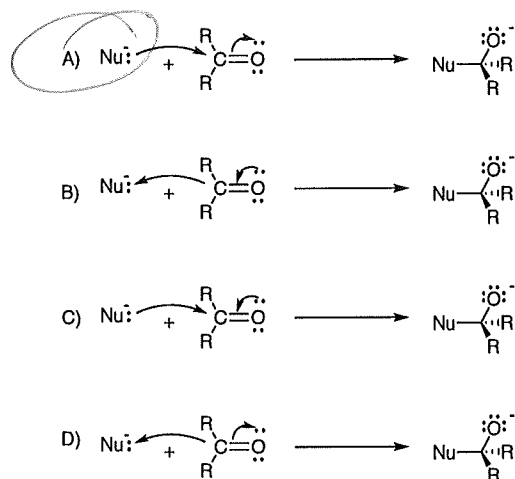


- A) $\text{H}_3\text{CO}-\text{C}_6\text{H}_4-\text{CH}_2\text{CH}_2\text{OH}$ B) $\text{H}_3\text{CH}_2\text{CO}-\text{C}_6\text{H}_4-\text{CH}_2\text{OH}$
 C) $\text{H}_3\text{CO}-\text{C}_6\text{H}_3(\text{CH}_3)(\text{CH}_2\text{OH})$ D) $\text{HOH}_2\text{CO}-\text{C}_6\text{H}_4-\text{CH}_2\text{CH}_3$

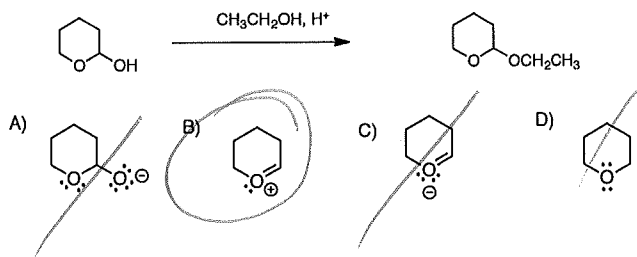
^1H NMR of the major product.



3. Which of the following correctly describes the movement of electrons in the reaction of nucleophile (Nu^-) with a carbonyl group?



4. What is an important intermediate of the following acetal formation?



Quiz 3 (25 pts)

CHEM 2542

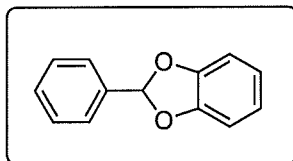
Spring 2018

Instructions:

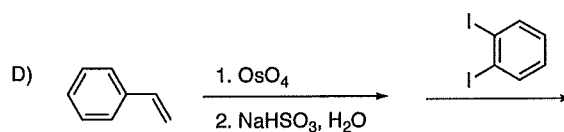
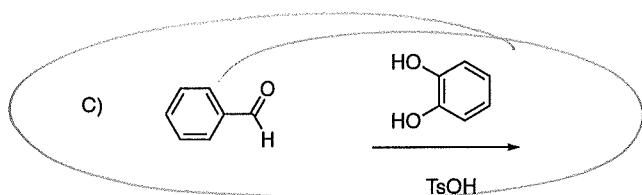
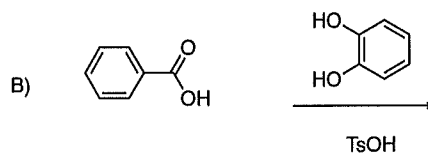
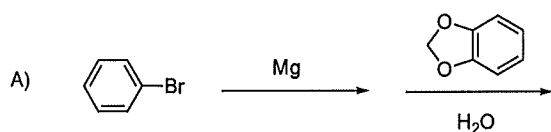
1. This quiz (25 pts) has 9 multiple choice questions (2 pts each = 18 pts) and one write-in question (6 pts). One additional point will if you do the following: Write your first and last name on the Scantron form AND write the first letter of your last name in enlarged form on the top right corner of the Scantron form.
2. Only the Scantron form will be collected and graded. The instructor will not grade Scantron forms that do not have a name on it. You can keep the booklet with the questions. The Scantron form will not be returned to you. However, you may come to the instructor's office (CHEM 319) and check the Scantron form for grading errors.
3. This quiz is closed book and/or notes. No calculators. There are periodic tables on the walls next to the black board, if you cannot read those periodic table it is your responsibility to point this out to the instructor.
4. There are some ^1H NMR shown on this quiz. Abbreviations:

s = singlet, d = doublet, t = triplet, q = quartet.
4. PLEASE DO NOT START WORKING ON THE QUIZ BEFORE EVERYBODY HAS RECEIVED A COPY OF THE QUIZ AND A SCANTRON FORM.

9. Consider the acetal shown in the box:



Which of the following reactions is expected to provide this compound in high yield?



Problem 10: "write -in" - Please use the back of the Scantron form.

The functional groups in the drawing below are labeled using the numbers 66 to 71. Identify the functional groups indicated by numbers in the molecule shown, and write answer into lines 66 to 71 on the back of the Scantron form (1 pt for each functional group, 6 pts total). Choose from the following as answers: ketone, amine, arene, oxime, lactone, alcohol, ester, amide, alkene, imine, thiol, enol, alkyne, carboxylic acid, nitro group, nitrile/cyano, acetal, hydrazone, acid anhydride, lactame, and aldehyde. – **Not all of these functional groups are present in this molecule.**

