



CHE 322 Organic Chemistry II

Exam 2 Form 1

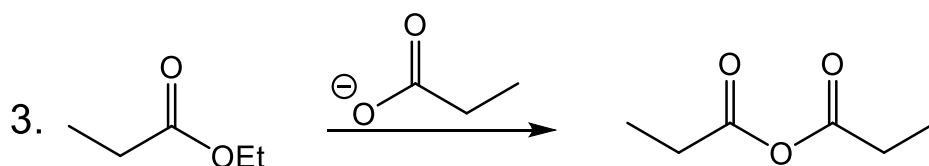
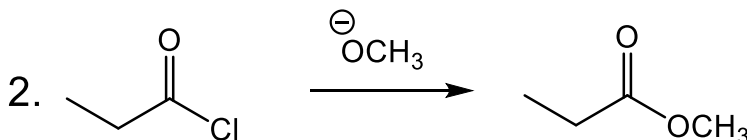
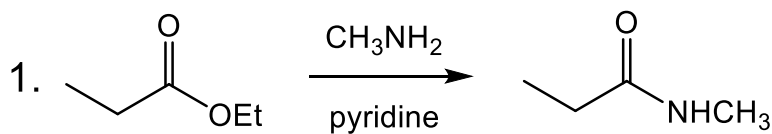
Thursday March 23, 2023

8:15 PM – 9:35 PM

1. Write your nine digit University ID number in the nine boxes provided and then bubble in each of the nine digits.
2. Print your name and sign your answer form using the spaces provided.
3. Questions 1 to 10 are multiple choice questions worth 5 points. Bubble your answers on the answer form. Questions 11-18 are short answer questions with points as indicated. Write out your answers in the indicated place on the answer form.

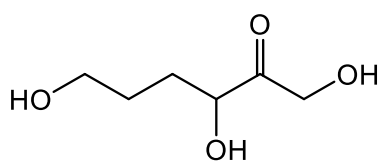
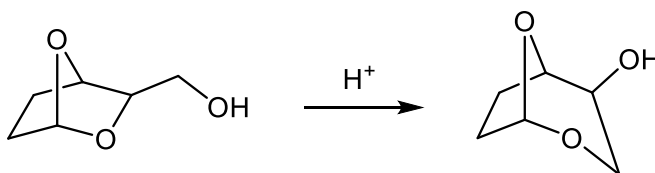
		Group																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Period	1	H																	He
	2	Li	Be											B	C	N	O	F	Ne
	3	Na	Mg											Al	Si	P	S	Cl	Ar
	4	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
	5	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
	6	Cs	Ba		Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
	7	Fr	Ra		Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn	Nh	Fl	Mc	Lv	Ts	Og

1. Which reaction(s) will give the product shown as the major one?

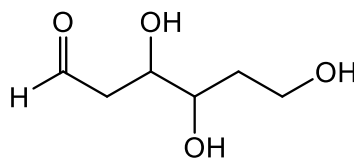


- A. 1 only B. 2 only C. 3 only D. 1 and 2 E. 1 and 3 F. 2 and 3

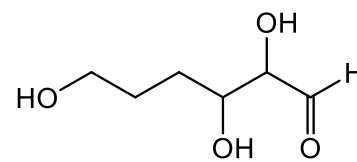
2. Choose the intermediate structure that forms during the following isomerization reaction.



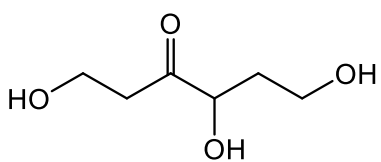
A



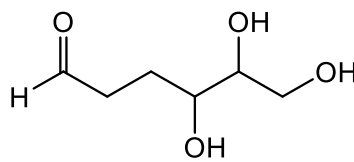
B



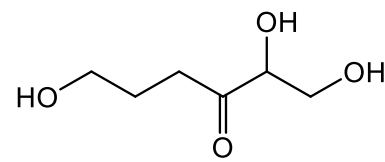
C



D

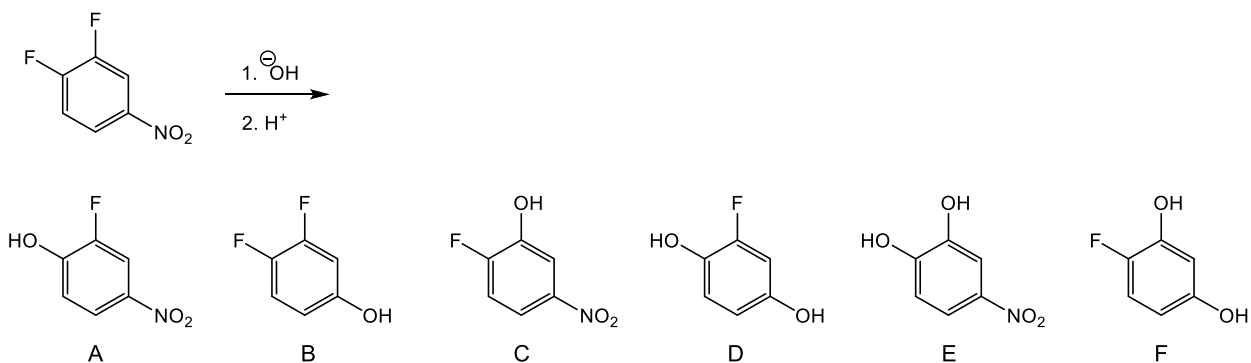


E

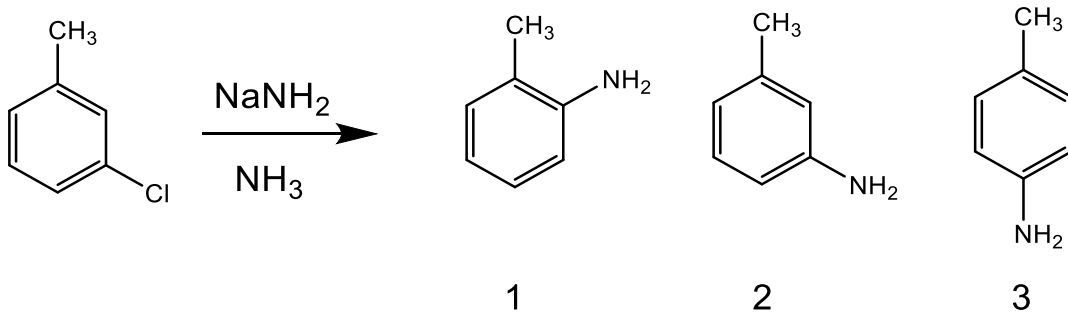


F

3. Select the major product of the following nucleophilic aromatic substitution reaction that follows an addition/elimination mechanism.

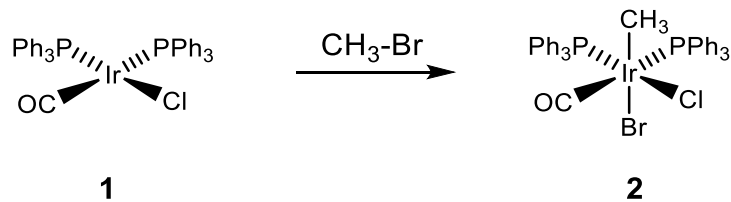


4. What product(s) is/are expected from the following nucleophilic aromatic substitution by an elimination/addition mechanism?



- A. 1 only B. 2 only C. 1 and 2 D. 1 and 3 E. 2 and 3 F. 1, 2 and 3

Use the following figure to answer the next two questions.



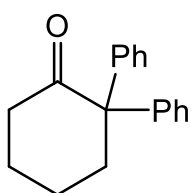
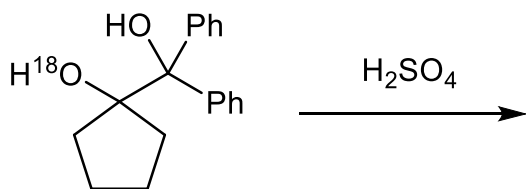
5. What is the oxidation state of iridium in intermediate **2**?

- A. -2 B. -1 C. 0 D. +1 E. +2 F. +3

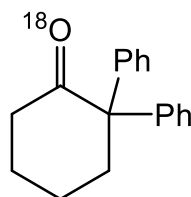
6. What is the valence electron count of **1** and the reaction type of the step shown?

- A. 14 electrons, and ligand association D. 16 electrons, and ligand association
 B. 14 electrons, and ligand insertion E. 18 electrons, and ligand insertion
 C. 16 electrons, and oxidative addition F. 18 electrons, and oxidative addition

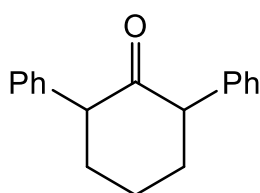
7. Choose the major product(s) of the following pinacol rearrangement that contains an oxygen-18 radiolabeled reactant.



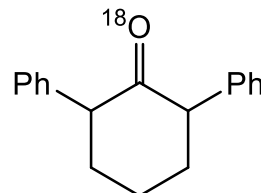
1



2



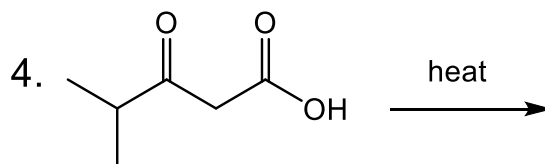
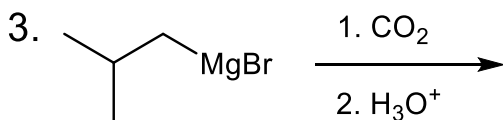
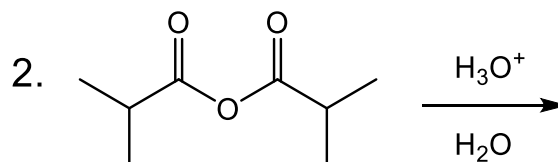
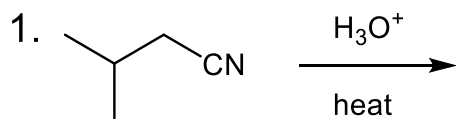
3



4

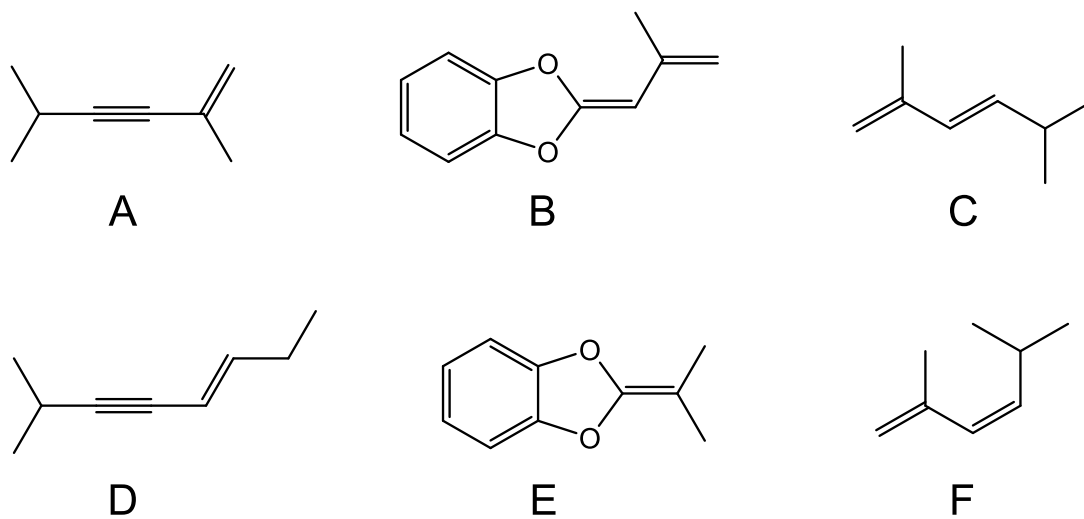
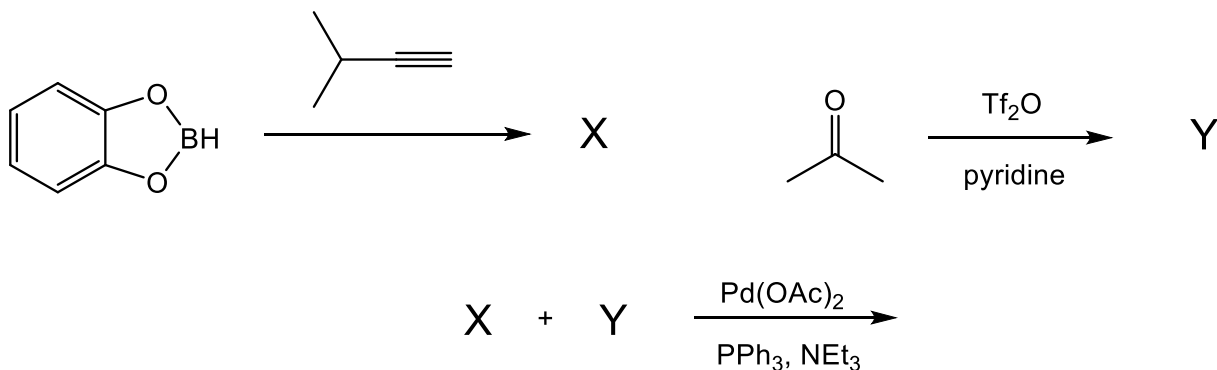
- A. 1 only B. 2 only C. 3 only D. 4 only E. 1 and 2 F. 3 and 4

8. Which reactions will give the same major product?

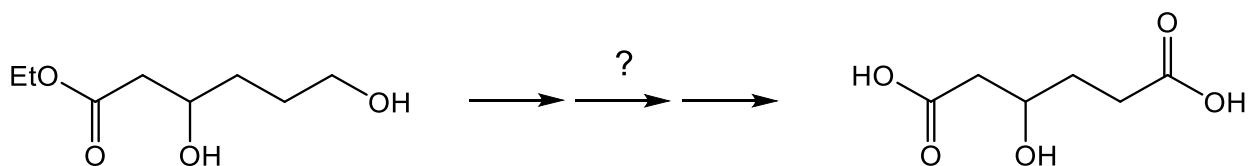
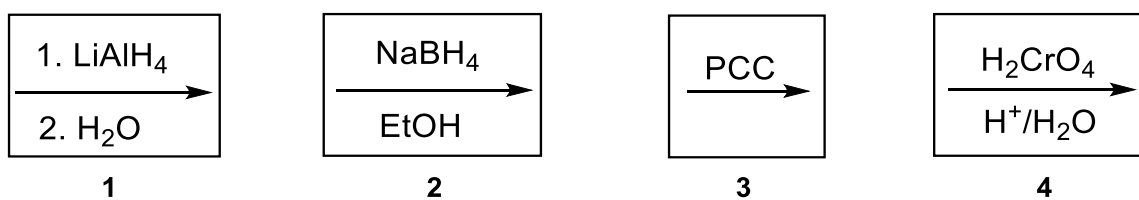


- A. 1 and 2 B. 1 and 3 C. 1 and 4 D. 2 and 3 E. 2 and 4 F. 3 and 4

9. Choose the correct product of the reaction between compounds **X** and **Y** with the shown catalyst.

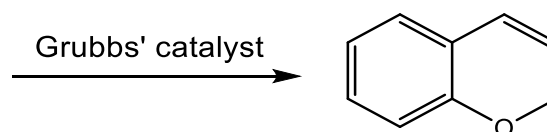


10. Using the reagents shown below, select the best route to complete the following synthetic transformation.

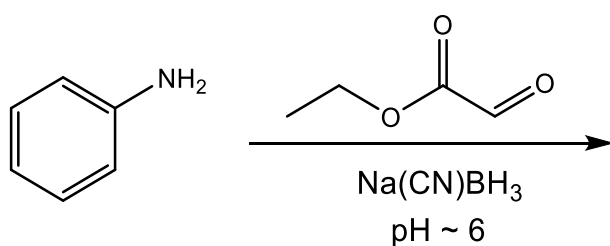


A. 4 only B. 1, then 3 C. 1, then 4 D. 2, then 4 E. 1, then 4, then 2 F. 2, then 3, then 1

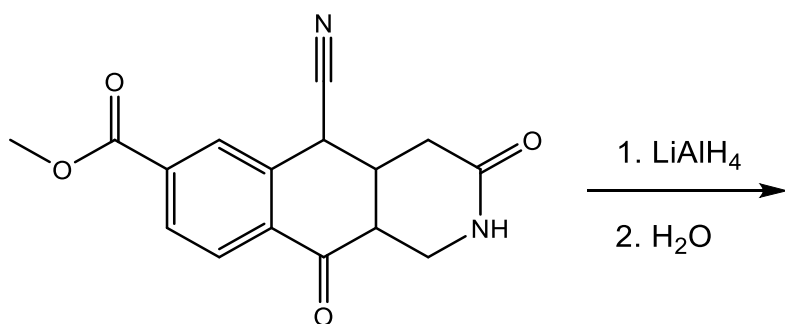
11. Draw the reactant of the following ring-closing metathesis. (5 points)



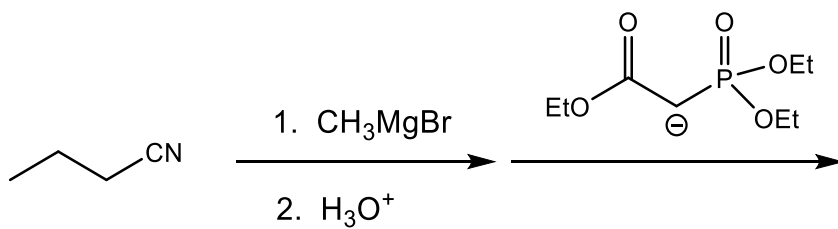
12. Draw the major product of the following reaction. (5 points)



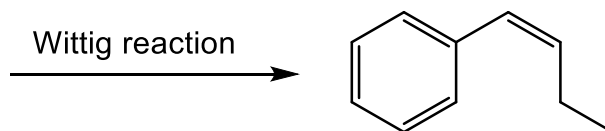
13. Draw the expected major product of the following reaction. (5 points)



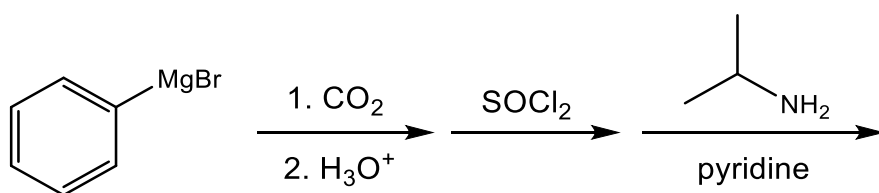
14. Draw the major product of the following reaction sequence. (5 points)



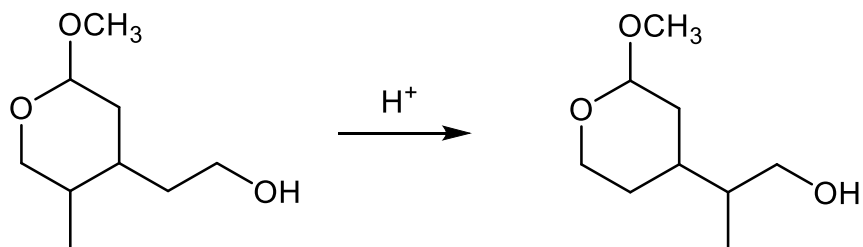
15. Draw the correct reactant and Wittig reagent that would give the following alkene as the major product. (5 points)



16. Draw the major product of the following reaction sequence. (5 points)



17. Draw a curved arrow mechanism for the isomerization reaction shown below. Hint: start by protonating the ring oxygen first. (10 points)



18. Propose a synthesis of the target compound using the starting material shown. You may use any other reagents/reactants. (10 points)

