CHM 234 : Spring 2020 : On Campus Class Midterm #3 (Online)

PRINTED **FIRST NAME** _____ ***PRINTED*** **LAST NAME** _____

YOUR CLASS (onground or hybrid) _____

Points by question

1_____/11

2_____/24

3_____/24

4_____/22

5_____/38

6_____/20

7_____/14

8_____/22

Extra Credit_____/5

Total _____/175+5
(incl Extra)

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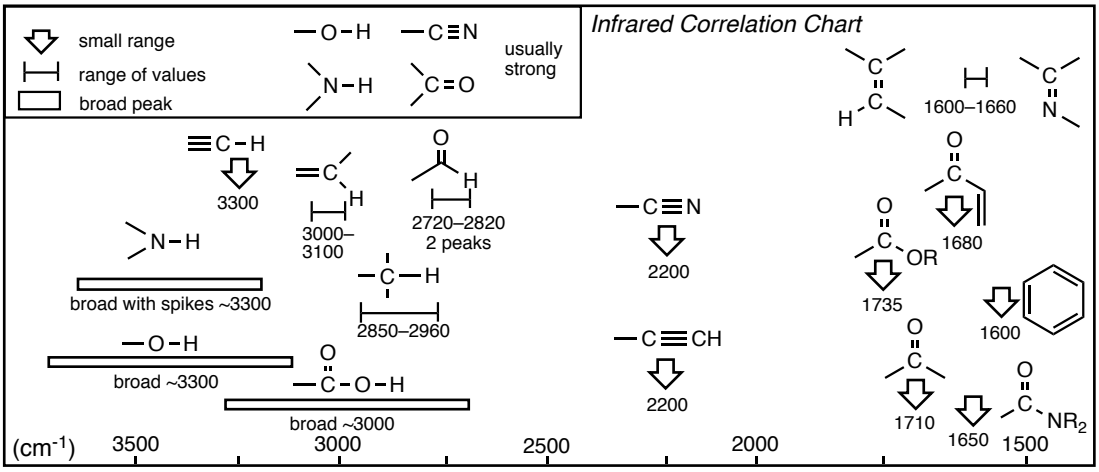
*** MOLECULAR MODELS ARE ALLOWED ***

****YOU ARE NOT ALLOWED TO KEEP SPARE COPIES OF THIS EXAM ****

H																		**He**
Li	**Be**											**B**	**C**	**N**	**O**	**F**		**Ne**
Na	**Mg**											**Al**	**Si**	**P**	**S**	**Cl**		**Ar**
K	**Ca**	**Sc**	**Ti**	**V**	**Cr**	**Mn**	**Fe**	**Co**	**Ni**	**Cu**	**Zn**	**Ga**	**Ge**	**As**	**Se**	**Br**		**Kr**
Rb	**Sr**	**Y**	**Zr**	**Nb**	**Mo**	**Tc**	**Ru**	**Rh**	**Pd**	**Ag**	**Cd**	**In**	**Sn**	**Sb**	**Te**	**I**		**Xe**
Cs	**Ba**	**Lu**	**Hf**	**Ta**	**W**	**Re**	**Os**	**Ir**	**Pt**	**Au**	**Hg**	**Tl**	**Pb**	**Bi**	**Po**	**At**		**Rn**

Interaction Energies, kcal/mol

Eclipsing		Gauche	
H/H	~1.0	Me/Me	~0.9
H/Me	~1.4	Et/Me	~0.95
Me/Me	~2.6	i-Pr/Me	~1.1
Et/Me	~2.9	t-Bu/Me	~2.7
Et/Et	~3.1		



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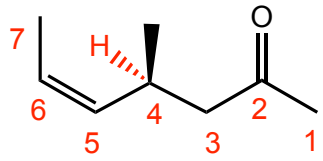
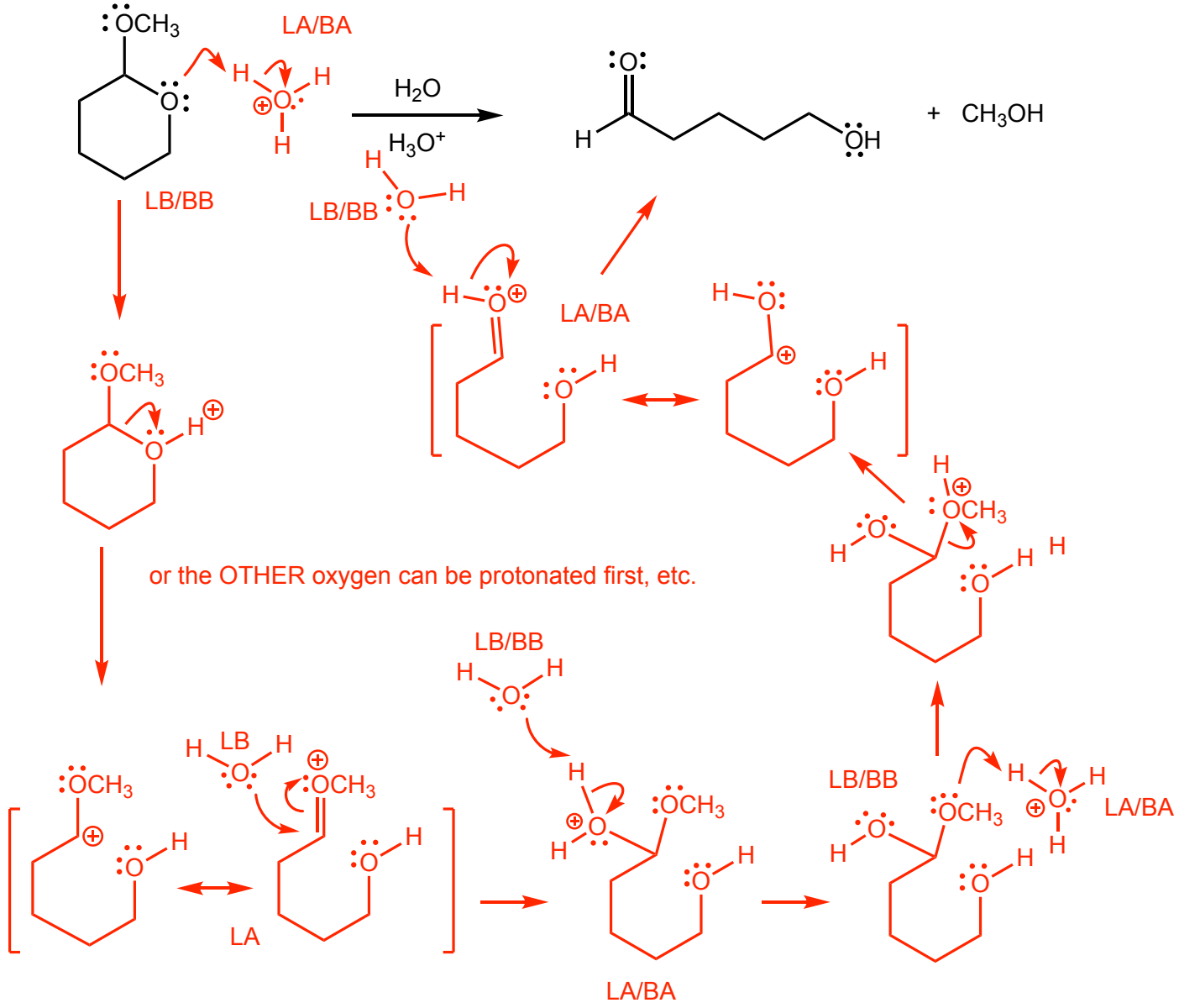
Question 1 (14 pts). Give the IUPAC name for the following compound. Be sure to use cis/trans, E/Z or R/S where appropriate.



(4S)-methylhept-(5Z)-en-2-one

Question 2 (25 pts.) Give a complete arrow-pushing mechanism for the following reaction, indicate the Lews and Bronsted acids/bases for each INTERMOLECULAR step (LB, LB, BB, BA), DRAW ALL RELEVANT RESONANCE CONTRIBUTORS FOR THE INTERMEDIATES



give the number of steps in your mechanism 7

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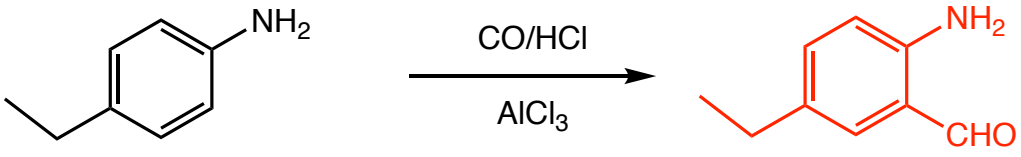
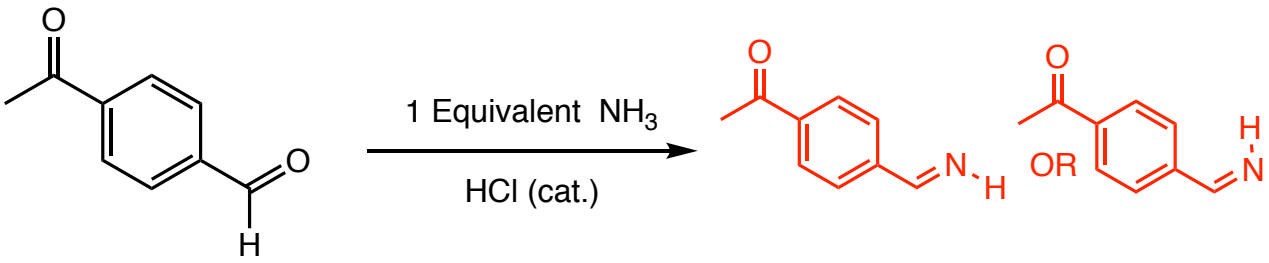
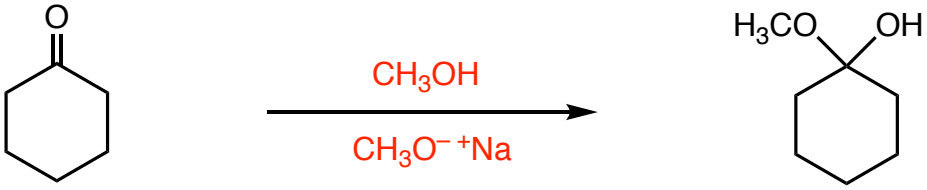
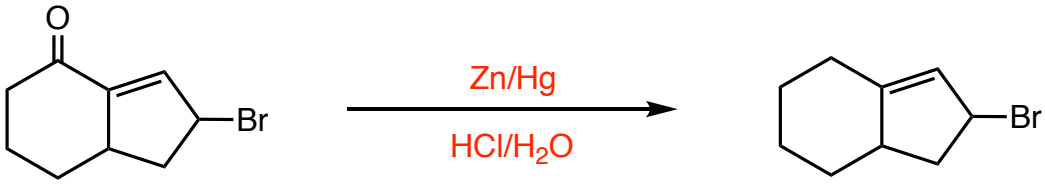
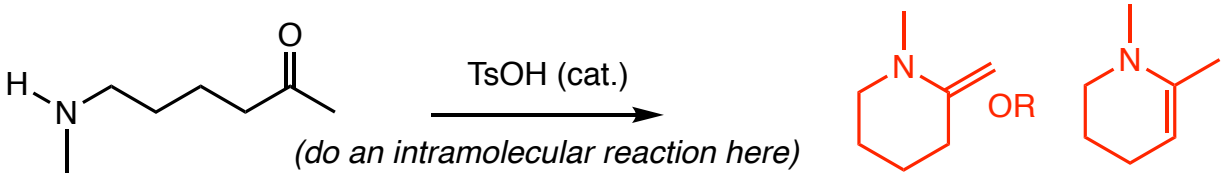
Question 3 (42 pts.) Provide the missing major organic products or reagents/conditions as appropriate, you can IGNORE stereochemistry in these problems

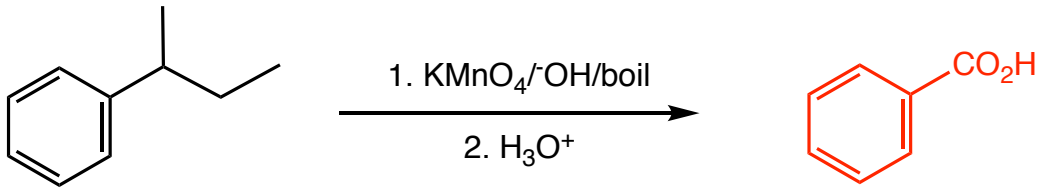
(a) 

(b) 

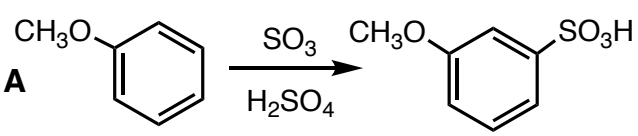
(c) 

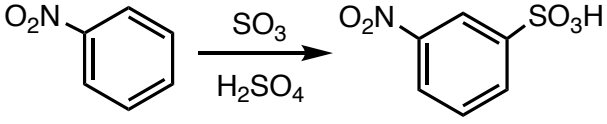
(d) 

(e) 

(f) 

Question 4 (14 pts.) Reaction **A** is faster than Reaction **B**. Give a BRIEF explanation.

A 

B 

electron donating groups are ACTIVATING, which makes reaction at ALL positions faster
electron withdrawing groups are DEACTIVATING, which makes reaction at all positions slower

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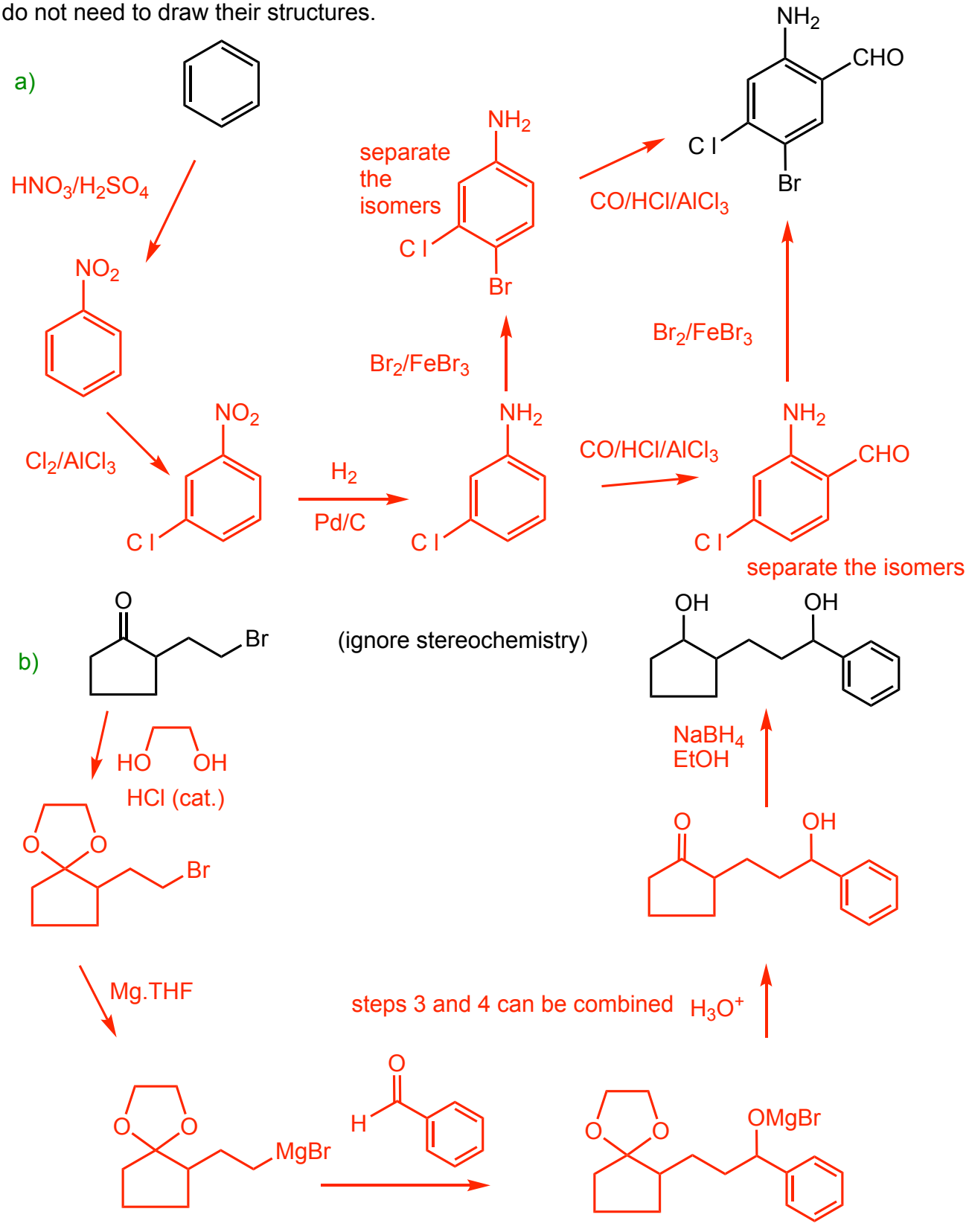
Question 5 (44 pts.) Synthesize the (target) molecules on the right from the starting molecules the left. this can not be done in one reaction. Give reagents and conditions and the intermediate molecules at each step. Do not show any mechanisms or transient intermediates. If other isomers are formed at any step then you need to indicate this but you do not need to draw their structures.



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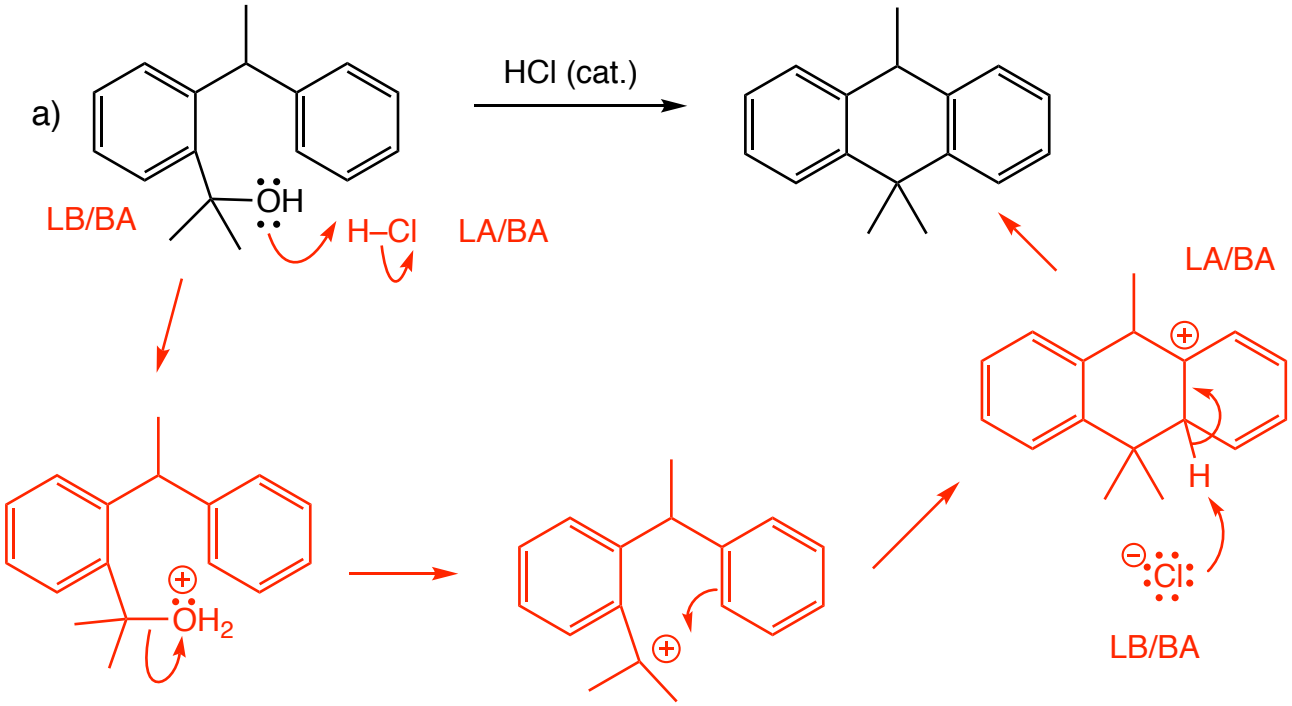
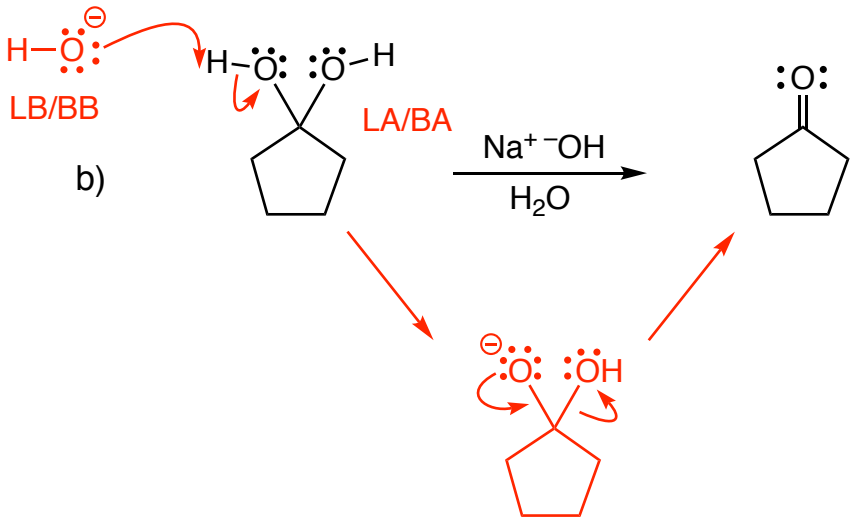
Question 6 (36 pts.)

a) Give a complete arrow-pushing mechanism for the following, indicate the Lews and Bronsted acids/bases for each INTERMOLECULAR step only (LB, LB, BB, BA), **but you do NOT need to show all resonance contributors for intermediates**



b) Give a complete arrow-pushing mechanism for the following, indicate the Lews and Bronsted acids/bases for each INTERMOLECULAR step only (LB, LB, BB, BA).



Extra credit question (5 pts). On what kind of structure is Agent Orange based on?

Ketone Chlorobenzene Benzaldehyde Acetal