CHEM 234, Spring 2010		First M	lidterm	1				lan R	. Gould
PRINTED FIRST NAME	<i>PRINTED</i> LAST NAME	Ξ				ASU – Postir	ID or ng ID		
Person on your LEFT (or Aisle)	-		P	erson	n on your l	RIGHT (d	or Aisle)	
PRINT YOUR NAME ON EACH PAGE! READ THE DIRECTIONS CAREFULLY USE BLANK PAGES AS SCRATCH PA work on blank pages will not be grade WRITE CLEARLY! MOLECULAR MODELS ARE ALLOWE DO NOT USE RED INK DON'T CHEAT. USE COMMON SENSE	1 2 3 ed 5 5		_/25 _/35 _/12 _/27 _/40 _/36						
	Ext	tra Cred	lit	_/5	1	Fotal (ind	cl Extra)/1	75+5
H				_	He	Intera	ction E	Inergies, kc	al/mol
Li Be	1		0 12	F	Ne	Eclip	psing	Gauch	ne
Na Mg	Ni Cu Zn d	Al Si E	P S	CI	Ar	H/H	~1.0	Me/Me	~0.9
K Ca SC TI V Cr Mn Fe Co	NI CU ZN (Ga Ge A	AS Se	Br T	Kr Vo	Me/Me	~1.4	i-Pr/Me	~0.95
Cs Ba Lu Hf Ta W Re Os Ir	Pa Ag Ca .	TU SU S	sd Te	1 2+	Rn	Me/Et	~2.9	t-Bu/Me	~2.7
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Usually Ostrong H -1 -2820 -2920 -2800 -2800 -2800 -2800 -2800 -2800 -2800 -2800 -2800 -2800 -2800 -2800 -2800 -2800 -2800 	- C≡N ↓ 2200 - C≡CH ↓ 2200	2000	H ²				Approximate Co Constants, J (H. ¹ H NMR Spect H H -C-C- H C=C' ~10 C=C' ~10 C=C' ~10 H C=C' ~10 C=C' ~10 H	upling z), for ctra ~ 7 H H H ~ 2 H
amine $R - NH_2$ variable and condition alcohol $R - OH$ dependent, ca. 2 - 6 δ	NMR Co	orrelation (Charts		-00	CH ₂ -	о - С-сн		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	¹ <u>Aromatic Ar — H</u> <u>mainly 8 - 6.5</u> <u>8 7</u> 160 140 ⊢ <u>Aroma</u>	$\frac{6}{120}$ $R_2C = C$ atic) R-C≡ ;R₂	, , , , , , , , , , , , , , , , , , ,)C=C 	$\begin{array}{c} -H_2C-X \\ \hline \\ H_2 \\$	H -H ₂ C-NR 2≡CH 3 0 CH ₂ - C-NR	$\begin{array}{ccc} \frac{3^{2}}{2} & \text{Alkyl} \\ & 3^{2} > 2^{2} > 1 \\ \frac{2}{40} & 20 \\ \hline & \text{Alkyl} & 3^{2} > 2 \\ \hline & 2 - X \\ \hline & 3^{2} - X \\ \hline & 3^{2} - 1 \end{array}$	$\frac{1}{2^{\gamma} > 1^{\gamma}}$

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NAME

Question 1 (25 pts). For each of the following 2 pairs of alcohols A and B: 1) Indicate the stronger Bronsted acid **AND** which would have the stronger conjugate base 2) Explain your reasoning using drawings of all of the conjugate base anions, and **include ALL** relevant resonance contributors as appropriate.

a)		÷÷: — Öн в
b)	а <u>Н</u> ю.	н- В

CHEMISTRY 234, Spring 2010 MIDTERM #1 - 3 - NAME______ Question 2 (35 pts.) Provide the missing **major organic products, ignore sterochemistry**



Question 3 (12 pts.) Give the IUPAC name for the following compound. Be sure to use cis/trans, E/Z or R/S where appropriate.



5 pts Extra Credit. Which functional group can be polymerized to form an organic metal? alcohol alkene alkyne epoxide CHEMISTRY 234,Spring 2010 Midterm #1 Question 4 (27 pts.) For each structure:

Decide which of the indicated bonds A and B is possible, or is preferred one, to make.
 In the provided boxes, give the reactant/reagents/conditions you would use to make that bond (step 2 is for acid or water workup steps if they are necessary, if not, leave step 2 blank).
 Briefly state why the other bond can not be made, or is not the preferred bond to make.

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NAME



The problem with making bond _____ is:

this structure	these reagents/conditions	
	1. 2.	

The problem with making bond _____ is:

this structure	+ these reagents/conditions	_
		A A
	1.	
	2.	Т

The problem with making bond _____ is:

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Question 5 (40 pts.) Show how you would synthesize the target componds on the right from the starting compounds on the left. Show reagents and conditions, and the structures of important intermediate compounds. Do not show any (arrow pushing) mechanisms.

a)

OH.





CHEMISTRY 234, Spring 2010 MIDTERM #1 ⁻⁶⁻ NAME Question 6 (36 pts). **READ THIS QUESTION CAREFULLY**! For **EACH** reaction, give a complete arrow pushing mechanism, and... 1) Show **ALL** important resonance contributors for all intermediates. 2) Add non-bonding electrons and C-H bonds to the line-angle structures as required. 3) Indicate the Lewis acid/Lewis base (LA, LB) at each step as appropriate, and whether

they are also Brønsted acids/bases (LA/BA, LB,BB).





