CHM 3150 Organic Chemistry II
Dr. Laurie S. Starkey, Cal Poly Pomona
Ch. 19 Ald/Ketones, Part 4 & Ch. 20 Carb. Acids, Part 1 – Practice Problems

For clicker question voting, go to:
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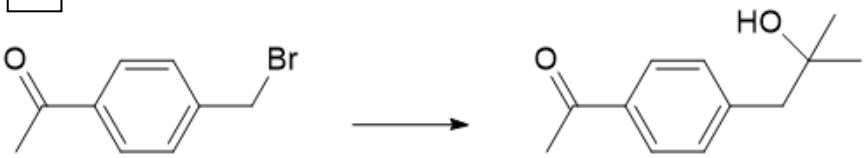
1



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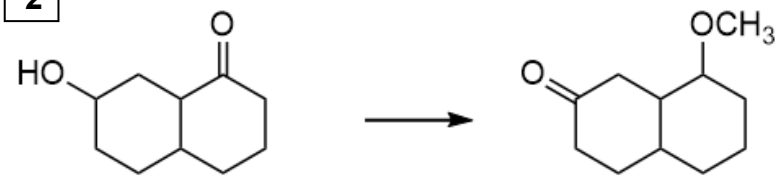
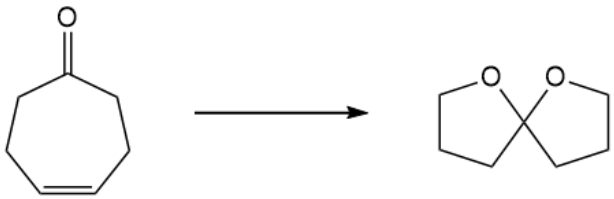


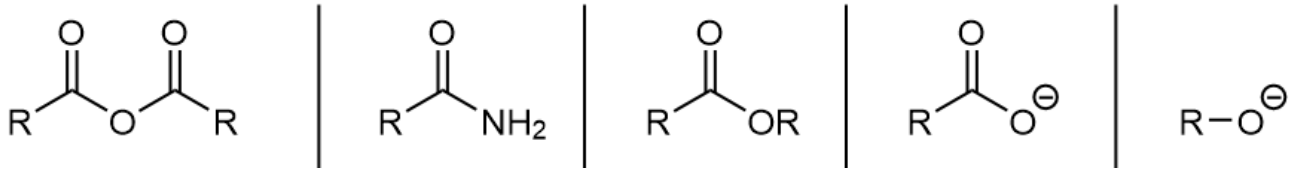
3 *Klein textbook problem 19.67a

Which reagents would be best to achieve the following synthesis*?

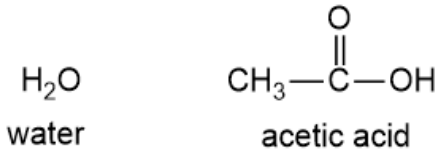


Match the functional groups to the correct names.

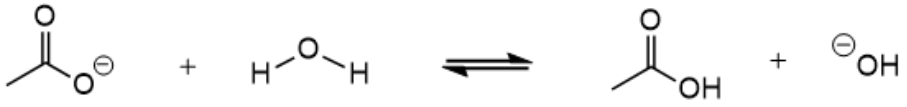
4



5 Which is the stronger acid? Explain briefly.

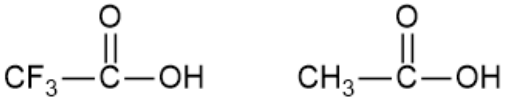


6 Provide curved arrows for the following proton-transfer reaction.
Determine the direction of the equilibrium (forward or reverse favored?).

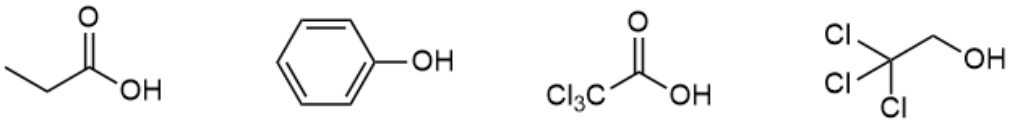


What predictions can you make about the relative K_a and pK_a values of the two acids shown below? Justify your answers.

7

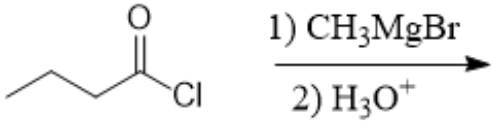


8 Arrange the following compounds from least acidic to most acidic.



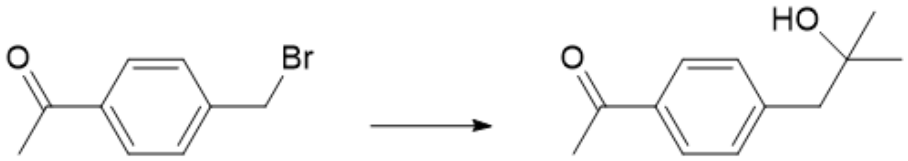
9

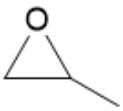
Predict the major product.

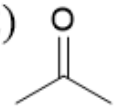


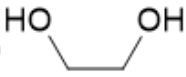
Which reagents would be best to achieve the following synthesis?

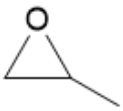
1

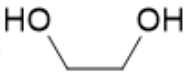


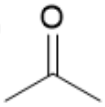
A) 1) Mg
2) 
3) H_3O^+

C) 1) Mg
2) 
3) H_3O^+

B) 1) 

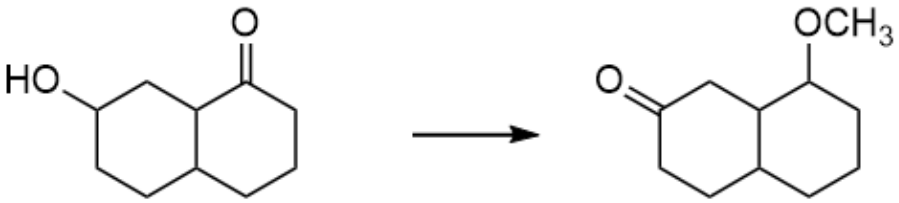
, TsOH
2) Mg
3) 
4) H_3O^+, heat

D) 1) 

, TsOH
2) Mg
3) 
4) H_3O^+, heat

Which reagents would be best to achieve the following synthesis?

2



A) 1) TMSCl, base
2) CH_3ONa
3) H_2/Pd
4) TBAF
5) PCC

B) 1) PCC
2) $NaBH_4$, MeOH
3) NaH
4) CH_3I

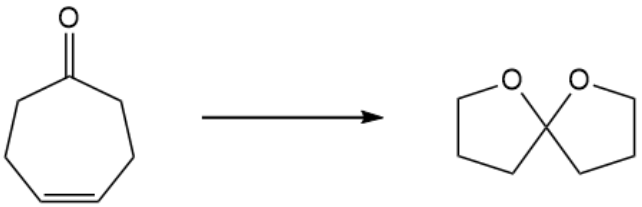
C) 1) TMSCl, base
2) $LiAlH_4$; wkup
3) NaH
4) CH_3I
5) TBAF
6) PCC

D) 1) CH_3OH, TsOH
2) PCC
3) H_3O+
4) CH_3ONa
5) H_2/Pd

E) 1) $NaBH_4$, MeOH
2) NaH
3) CH_3I
4) PCC

Which reagents would be best to achieve the following synthesis*?

3



A) 1) $SOCl_2$
2) O_3; DMS
3) $LiAlH_4$; wkup
4) NaH

B) 1) O_3; DMS
2) $LiAlH_4$; wkup
3) TsOH

C) 1) MeOH, TsOH
2) O_3; DMS
3) $LiAlH_4$; wkup
4) H_3O^+ heat
5) TsOH

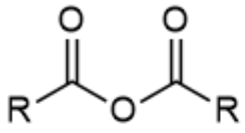
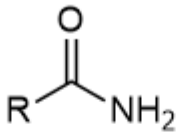
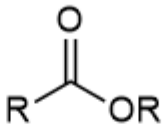
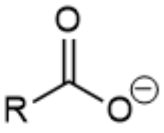
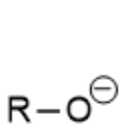
D) 1) MeOH, TsOH
2) O_3; DMS
3) $LiAlH_4$; wkup
4) H_3O^+ heat
5) NaH

E) 1) O_3; DMS
2) $LiAlH_4$; wkup
3) TsCl, py
4) NaH

*Klein textbook problem 19.67a

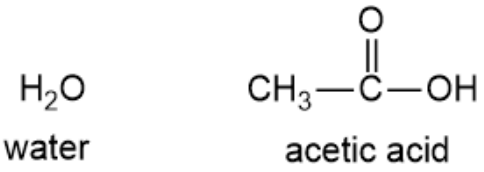
4

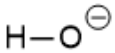
Match the functional groups to the correct names.

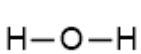
					
A)	ether	amide	ether	carboxylic acid	alcohol
B)	anhydride	amide	ester	carboxylate	alkoxide
C)	anhydride	amine	ester	carboxylate	alkoxide
D)	ether	amine	ether	carboxylate	alcohol
E)	anhydride	amide	ester	carboxylic acid	alkoxide

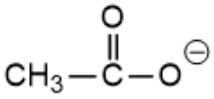
5

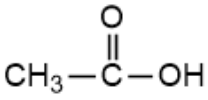
Which is the stronger acid? Explain briefly.



A) Because this is more stable: 
water is the **stronger** acid.

B) Because this is more stable: 
water is the **weaker** acid.

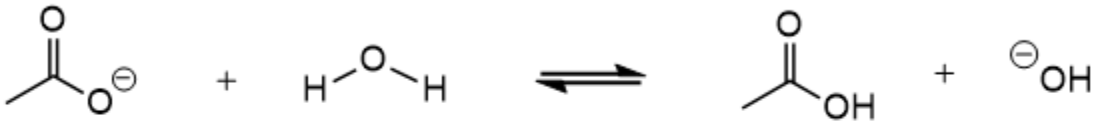
C) Because this is more stable: 
acetic acid is the **stronger** acid.

D) Because this is more stable: 
acetic acid is the **weaker** acid.

E) It's impossible to predict acid strength without pK_a data.

6

Provide curved arrows for the following proton-transfer reaction.
Determine the direction of the equilibrium (forward or reverse favored?).



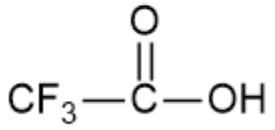
A) Forward, because acetate is the weaker base.

B) Forward, because hydroxide is the weaker base.

C) Reverse, because acetate is the stronger base.

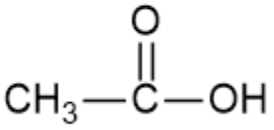
D) Reverse, because hydroxide is the stronger base.

7 What predictions can you make about the relative K_a and pK_a values of the two acids shown below? Justify your answers.



trifluoroacetic acid

X



acetic acid

Y

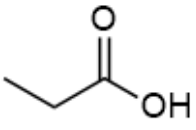
A) **X** has the larger K_a and the larger pK_a.

B) **X** has the larger K_a and the smaller pK_a.

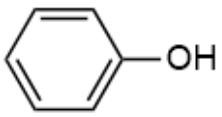
C) **Y** has the larger K_a and the larger pK_a.

D) **Y** has the larger K_a and the smaller pK_a.

8 Arrange the following compounds from least acidic to most acidic.



I



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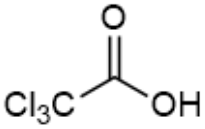
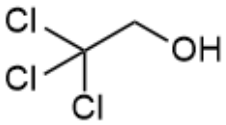


III



IV

A) IV < II < I < III

B) I < III < II < IV

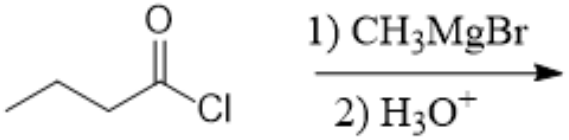
C) IV < I < III < II

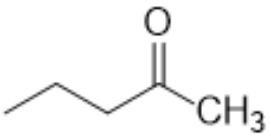
D) I < IV < III < II

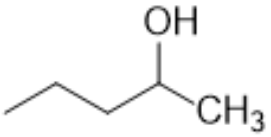
E) II < IV < I < III

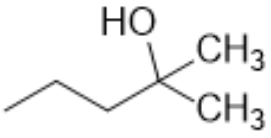
9

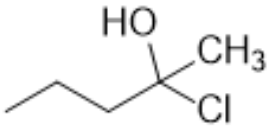
Predict the major product.



A) 

B) 

C) 

D) 

E)