

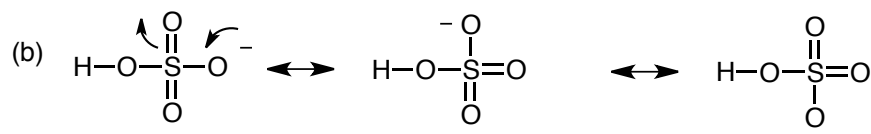
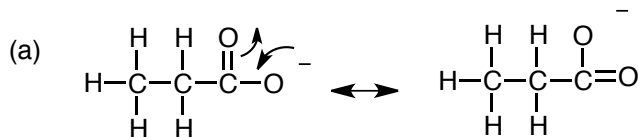
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L. I. U.  
ANSWER KEY

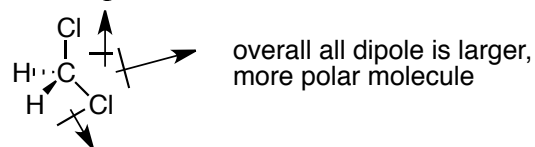
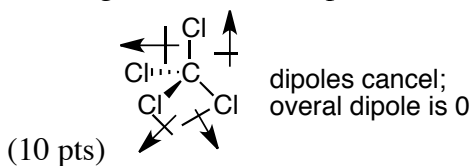
Chem. 121, Sect 010, Quiz 1

Fall, 2012, 50 points

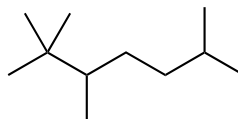
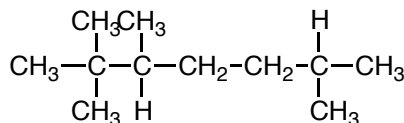
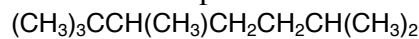
1. Write Lewis structures for the following compounds. Assign formal charges, if any, to the correct atom(s). Show all unpaired electrons and also show all possible resonance structures. (10 pts.) (a)  $C_2H_5CO_2^-$  (b)  $HSO_4^-$  (10 pts)



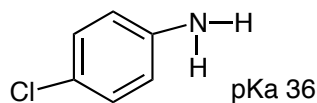
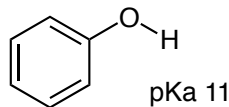
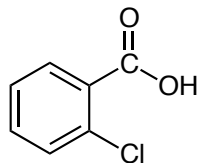
2. Which is more polar,  $CCl_4$  or  $CH_2Cl_2$ ? Explain by making careful 3-dimensional drawings showing all individual dipole moments and the overall dipole moment for each molecule.



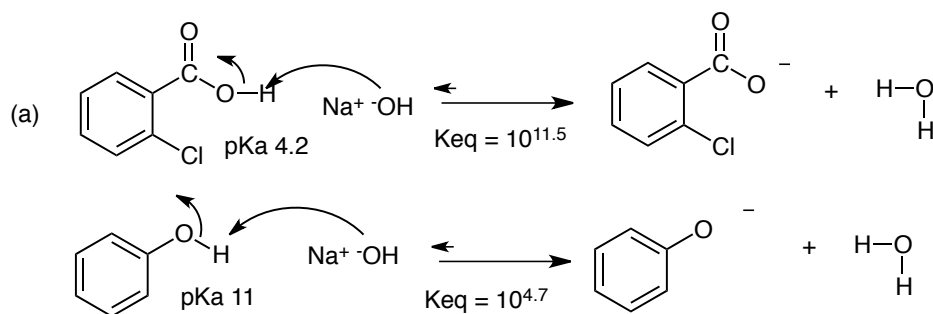
3. Draw the expanded and bondline formulas for the following molecule (10 points)



4. In Lab 2, the Separation of An Unknown Mixture, one student made a mistake and used 1.5 M sodium hydroxide (NaOH,  $pK_a H_2O$  15.7) in the first step instead of sodium bicarbonate ( $NaOCO_2H$ ,  $pK_aH$  6.2). (a) Which compound(s) would be extracted into the aqueous layer in step 1? Explain by showing all the reactions that would occur. (b) What compound(s) would be extracted in step 2 when 1.5 M NaOH was used again? (c) What compound would be extracted in step 3 when the 1.5 M HCl ( $pK_a$  -3.7) was used? Show the reaction that occurred. (d) Show the reaction(s) that occurred when con. HCl was added to flask 1 for the student described above. (e) Show the reaction that occurred when 3M NaOH was added to flask 3. The unknowns are shown below.



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(b) Nothing would be extracted into the aqueous layer in step two. The amine does not react with NaOH.

