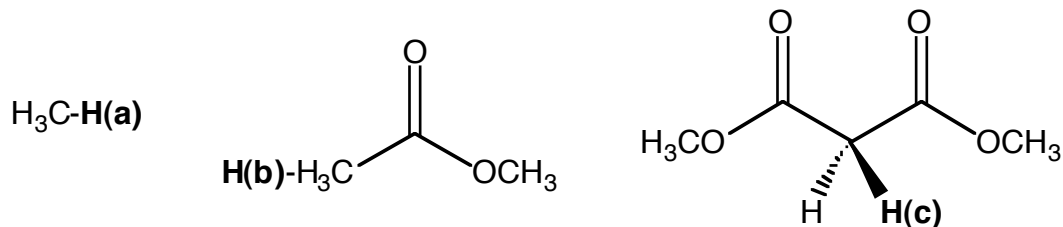


Chemistry 211 – Problem Set 3 – Due September 19th at 5:00 PM

- 1) You measured the pK_a values of the highlighted hydrogen atoms in the following molecules (15 points):

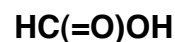
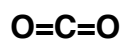
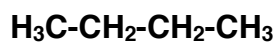


You found that $pK_a H(a) \gg pK_a H(b) \gg pK_a H(c)$. Explain this trend in the pK_a values.

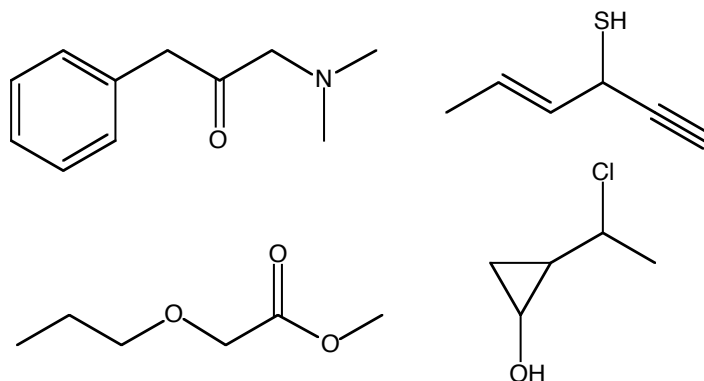
- 2) For the following Brønsted-Lowry acid/base pairs, find the pK_a values of each molecule in a pair (use a book or the WWW), and determine which one will be the acid and which one the base when the two are combined. For diprotic acids consider the first ionization constant only (15 points).



- 3) Arrange the following compounds in order of increasing boiling point (yes, you can look up the boiling points on the WWW). Explain your answers based on your knowledge of van der Waals interactions (15 points).



- 4) Identify and name all the functional groups on the following molecules (15 points):



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5) a) Using bond-line representation, draw the compounds whose IUPAC names are presented below (16 points):

i) 2-Ethyl-2,5-dimethyldecane

iv) 2-Ethyl-3-butylheptane

ii) 2,2,3-Trimethylpentane

v) 2,2,6,6-Tetramethyl-4-propyloctane

iii) 6-(1,1-Dimethylethyl)-2-methylnonane

vi) 5-neopentyldecane

b) Some of the compounds presented above are miss-named. Identify one, and provide its correct IUPAC name (4 points).