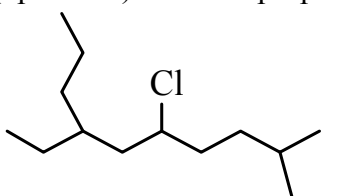


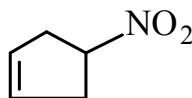
1. (4pts each) Write balanced net ionic equations for the reactions that may occur when each of the following pairs is mixed:

- a) H_2SO_4 and BaCl_2 b) $(\text{NH}_4)_2\text{SO}_4$ and NaCl c) $\text{Pb}(\text{NO}_3)_2$ and MgSO_4

2. (4pts each) Give the proper name of the following organic compounds.



(a)



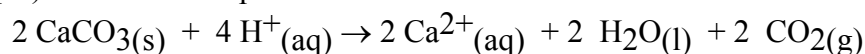
(b)



(c)

3. (8 pts) Which is the better solvent for CH_3NH_2 , water or hexane? Thoroughly discuss the type and size of the intermolecular attractions that make CH_3NH_2 more soluble in your choice of solvent.

4. (5 pts) Write the K expression for

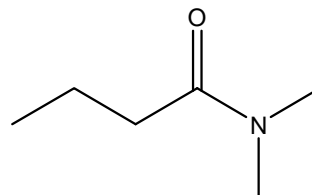
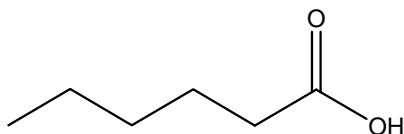


5. (4pts each) Draw the line structure for the following:

- a) 2,3,4-trimethylhexane b) 3-ethyl-4-decanol c) cis-6-chloro-3-heptene

6. (10 pts) What is the freezing point of a solution prepared from 50.0 g ethylene glycol ($\text{C}_2\text{H}_6\text{O}_2$) and 85.0 g H_2O ? $K_f = 1.86^\circ\text{C}/\text{m}$

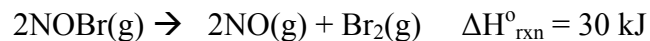
7. (6pts each) Circle the functional group and identify the type of compound in each of the following:



8. (8pts) Arrange the following aqueous solutions in order of increasing boiling points:

- (a) 0.050 m $\text{Mg}(\text{NO}_3)_2$ (b) 0.100 m ethanol (c) 0.090 m NaCl .

9. (2pts each) How will this system at equilibrium shift in each of the following cases: Just indicate the shift.



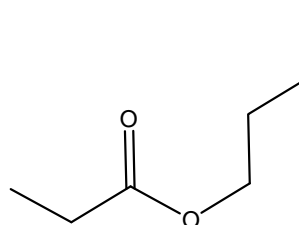
a) increase the total pressure by decreasing the volume

b) add more NO

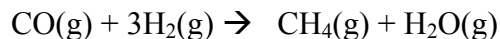
c) remove Br_2

d) lower the temperature

10. (5pts) Write the reaction formula for the alcohol and the carboxylic acid from which the following ester was prepared.



11. (4pts each) Tell how the changes stated below will affect (decrease, increase or no effect) the equilibrium concentration of CH_4 in the reaction mixture represented below. Explain.



a) H_2O is added

b) Addition of CO_2

c) H_2 is removed