

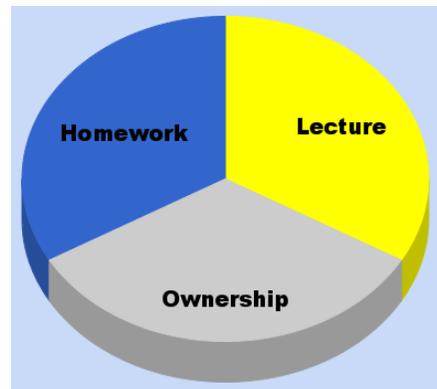
Worksheet 18 – CHEM 121 – Fall 2015

Monday Name: _____

Wednesday Name: _____

Directions: Per the usual: for 40 minutes without notes; with non-programmable calculator and your partner. Next 10 minutes with your notes, et al. Last 25 minutes on the board.

1) Explain and illustrate osmosis.



2) Explain and illustrate diffusion of a solute.

3) Explain what a concentration gradient is.

4) Illustrate and explain the effects of hypertonic, isotonic and hypotonic solutions on cells.

5) Define crenation and lysis.

6) Bromocresol purple is _____ under acidic solutions and _____ under alkaline conditions.

7) Phenolphthalein is _____ under acidic conditions and _____ under alkaline conditions.

8) Litmus is _____ under acidic conditions and _____ under alkaline conditions.

9) A colloid is:

10) The dispersing medium is:

11) The dispersed phase is:

12) Explain (and illustrate) how ion exchange chromatography can be used to soften water.

13) Explain with illustrations how GPC/SEC works.

14) If you had a sample that contained three molecules A with MW of 500, B with MW of 9000 and C with MW of 150, in what order would they elute from an SEC column?

15) If the polarity scale has a value between 5.0 (apolar) and 150 (polar) and you had a sample that contained three molecules A with a polarity value of 124, B with a polarity value of 32 and C with a polarity value of 73, in what order would they elute starting with water and switching about halfway to isopropyl alcohol?

16) A sample has a K_p of 0.33. Explain what this means.

17) A sample has a K_p of 33. Explain what this means.

18) Explain in your own words what boiling point is.

19) Explain in your own words what boiling point is.

20) Give an application of boiling point elevation and freezing point depression.

21) Draw an illustration of vapor pressure and the ensuing reduction thereof.

22) Draw your own version of a non-electrolyte solution and how you'd detect the non-electrolytic nature of the solution.

23) Draw your own version of an electrolyte solution and how you'd detect the non-electrolytic nature of the solution.

24) Illustrate and explain LeChatelier's Principle using your own illustrations.

25) Write out the complete and correctly balanced reaction between carbon dioxide and water. Name the reactants and the product.

26) Write out the complete and correctly balanced reaction between the bicarbonate ion and a proton. Name the reactants and product.

27) Explain in your own words what a buffer is.

28) Illustrate and explain the differences between unsaturated, saturated and super-saturated solutions in the space, below.

29) Define the Tyndall effect.

30) Describe how an electrolyte solution would have a different osmotic pressure than a nonelectrolyte solution.

31) Which of the following compounds are soluble in water?

A) PbCl_2

B) LiCl

C) $(\text{NH}_4)_2\text{SO}_4$

D) AlF_3

E) SrCl_2

F) LiOAc

G) H_2SO_4

H) H_3PO_4

32) A solution is prepared with 565 mg $\text{K}_4\text{Fe}(\text{CN})_6$ in water and diluted to 1375 mL. Calculate the following:

A) The molarity of the potassium ferrocyanide solution

B) The w/v% of the potassium ferrocyanide solution

C) The ppm of the potassium ferrocyanide solution

33) How would you prepare 500 mL of the following nitric acid solutions with the Analytical Chemistry approach?

A. 1:4

B. 2:3

C. 4:5

D. 1:16

E. 1:24

F. 1:2

34) How would you prepare 750 mL of the same solutions as above of the nitric acid solutions with the Biochemistry approach?

35) A solution of CaCO_3 is 0.25 M. If the solution is at 35°C , what is the osmotic pressure of the solution? What is its osmolarity? $R = 62.4 \text{ torr}\cdot\text{L}/\text{mol}\cdot\text{K}$.