Homework 5

**Distributed: Wednesday, February 21, 2001**   **Due: Wednesday, February 28, 2001**

Name _____ Recitation Section (circle one): Dan: 9:30 10:30   Aimee: 9:30 10:30

How much time did you spend on this assignment (include time spent on practice problems)?_____(This is used only to monitor class work load.)

Although this assignment does not require use of the "Chemical Laboratory Simulation", you may use the simulation to check your answers to questions 2-7. Please follow the link on the course website to access the virtual lab.

1) (2pt) Use thermodynamic data in the back of your book to decide whether the equilibrium constant for the following reaction will increase or decrease with temperature? (Please show your work.)

$$CH_{4(g)} + 2\ H_2S_{(g)} \rightleftharpoons CS_{2(g)} + 4\ H_{2(g)}$$
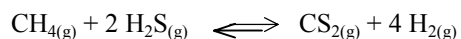
What happens to the ratio of $\dfrac{P_{H_2S}}{P_{CS_2}}$ if the volume is decreased?

What happens to the ratio of $\dfrac{P_{H_2S}}{P_{CS_2}}$ if $CH_{4(g)}$ is added ?

2) (1pt) How many ml of 10.0M NaOH do I need to add to 100ml of 1.00M NaOH to get a solution that is 5.00M in NaOH? (Please show your work.)

> Amount of 10M NaOH = _____ml

3) (1pt) How many ml of 10.0M HCl do I need to add to 100ml of 1.00M NaOH to get a solution with pH = 7? (Please show your work.)

> Amount of 10M HCl = _____ml

4) (1pt) 75.0ml of 1.00M HCl is added to 100ml of 1.00M NaOH. What is the pH of the resulting solution? (Please show your work.)

pH = _____

5) (2pts) How many ml of 1.00M HCl do I need to add to 10.0ml of 1.00M NaOH to get a solution with pH = 13? (Please show your work.)

Amount of 1M HCl = _____ml

6) (2pts) How many ml of 1.00M HCl do I need to add to 10.0ml of 1.00M NaOH to get a solution with pH = 1? (Please show your work.)

Amount of 1M HCl = _____ml

7) (1pt) What is the pH of a 2.50M solution of acetic acid (Hac = CH_3COOH)? (Please show your work.)

pH = _____