

## Homework 6

**Distributed: Friday, March 2, 2001**

**Due: Wednesday, March 7, 2001**

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

Other members of your work group (if you worked with others) \_\_\_\_\_

You may use the virtual lab (on the links page of the course web site) to check your answers to some of these problems.

1) (2pts) Consider 50ml of a 1M solution of HClO. You can add 50ml of any one of the following solutions:

1M NaF

1M NaClO

1M NaCN.

Assume you want the resulting solution to have the smallest [HClO] possible. Which of the above three solutions would you add and why. (Please circle one of the above and give the reason for your answer below.)

2) (4pts) You have two bottles, one filled with 1M NaAc (NaAc = sodium acetate) and one filled with 1M HCl. You want to make 100ml of a buffer with pH=5.2 by mixing together appropriate amounts of these solutions. How much of each solution do you use? (please show your work)

vol of NaAc = \_\_\_\_\_ ml; vol of HCl = \_\_\_\_\_ ml  
(above should add to 100ml)

- 3) (4pts) Methyl red has two forms, a red form at low pH and a yellow form at high pH (see Figure 10.8 of the textbook). You add 75ml of 1.0M NaClO to 50ml of 1.0M HClO. You add a drop of indicator solution containing methyl red (you can ignore dilution effects due to the addition of the drop). What is the color of the solution? What is the ratio between the concentration of the red and yellow forms of methyl red ( $[\text{red form}]/[\text{yellow form}]$ )? (Please show your work and explain your answer.)

Color = \_\_\_\_\_  $[\text{red form}]/[\text{yellow form}] =$  \_\_\_\_\_