Chemistry 106 Fall 2006 Exam 3 **Form D**

1) Name _____

You are to keep this copy of the test. Your name is in case you leave it behind.

2) Use only a #2 pencil on the answer sheet.

3) Before starting the exam fill in your student ID# (not your SS#). Also fill in your name, course number and sign the

   form.

4) Fill in the test form section (A, B, C or D). Which form you have is shown in the upper right corner.

5) Do not begin the exam until you are told to.

6) **You will not get your scan sheet back!!!** Circle your answers on this exam sheet and then transfer them to the scan

   sheet when you are satisfied with all your answers. An answer key will be posted on the class web site and in the

   glass case across from the lab after the exam.

7) If atomic weights are needed use only those from the attached periodic table.

8) **No scratch paper is to be used.**   Use the back of this exam sheet if necessary.

9) There are 34 equally weighted questions on this exam. You have 90 minutes to complete them.

10) **If you believe there is more than one correct answer pick only the best answer.**

Useful Data

<u>Constants</u>

Density of H_2O = 1.00 g/mL

Heat capacity of H_2O=$C(H_2O)$ = 4.184 J•g^{-1}•K^{-1}

N_A(Avogadro's #) =6.022 x 10^{23} particles•mol^{-1}

R (gas constant) = 8.3145 J•mol^{-1}•K^{-1}

   or 0.08206 L•atm•mol^{-1}•K^{-1}

K_w = 1.00 x 10^{-14}

<u>Units</u>

2.54 cm = 1 inch

3.78 L = 1 gal

1 kg = 2.20 lb

1 % = 10,000 ppm

1 hr = 60 min

1 min = 60 seconds

1 amu = 1.660540 x 10^{-27} kg

molarity (M) = moles solute/L sol'n

molality (m)= moles solute/ kg solvent

<u>Equations</u>

% = fraction • 100 %

ppm = fraction • 10^{6}ppm

T (in Kelvin) = 273.15 + T (in ˚C)

T (in Celsius) = (5/9) (T (in F) -32)

Rate = k $[A]^m[B]^n$ for aA+bB--> cC+dD

$K = k_f / k_r$

$K_{ov} = K_1^pK_2^qK_3^r$....

$K_P = K_C(RT)^{\Delta n}$

$K = \exp(-\Delta G°/\{RT\})$

$\Delta G° = -RT \ln K$

$\Delta G = \Delta G° + RT \ln K$

~~lnK = (-ΔH°/R)(1/T) + ΔS°/R~~ not discussed F07

~~ln(K₂/K₁) = (-ΔH°/R)(1/T₂ – 1/T₁)~~ not discussed F07

pH = pK_a + log([base]/[acid])

pH = -log [H$^+$]

pH + pOH = pK_w and $K_W = K_aK_b$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$K_{sp} = [M^{m+}]^n[L^{n-}]^m$