CHM-113-B

Final Exam Instructions **NAME** _____

1. All multiple choice answers are to be submitted on the answer sheet provided. The **best** answer to each question should be indicated by marking with a **pencil** in the space provided. The color marked on the top of the answer sheet should match the color of this page. There is only one answer for each question. **Turn in both the answer sheet and the exam.**
2. Print your name on the computer answer sheet. Then code it by darkening the appropriate letters with a **pencil**. Code your LAST (family) name **first**.
3. Code your identification number (ASU 10-digit Affiliate ID, not your Social Security Number) in the "Identification #" section of the answer sheet. **This is very important.** Failure to properly code the answer sheet could result in the loss of your grade.
4. Put all calculations on the examination pages. **Do not put any extra marks on the computer answer sheet.**
5. Since the examination will be computer graded, read the directions for marking answers, located on the back of the answer sheet very carefully before starting.
6. The computer answer sheet and the exam will not be returned to you but may be viewed in PS H-240 if there is any question of accuracy in grading.
7. You may explain answers to any questions if you are unsure of your answer. These answers will be graded for **partial credit** if you are close enough to a grade borderline for extra points to make a difference. Mark the question with an asterisk (*) in the margin and place your explanation on the back of that page.
8. The exam consists of **50 multiple choice questions worth 4 points each**. Make sure that your copy of the exam contains all questions.
9. A periodic table is attached to the end of the examination.
10. Grades will be posted in my display case near the second-floor H-wing labs.
11. Some information you may find useful:

T (in K) = t (in ^{o}C) + 273.15

mass of electron = 0.000549 amu mass of proton = 1.00728 amu mass of neutron = 1.00867 amu

Avogadro's number, N = 6.02×10^{23}

Activity: Li > K > Ba > Ca > Na > Mg > Al > Zn > Fe > Cd > Ni > Sn > Pb > H > Cu > Hg > Ag > Au

specific heat in J/g°C = 2.02 for ice, 4.184 for water, 2.02 for steam

ΔH_{vap} of water = 4.07×10^{4} J/mol, ΔH_{fusion} of ice = 6009.5 J/mol

$M_1V_1 = M_2V_2$

$\Delta E = q + w$

$q = n C_m \Delta T$ $q = m$ sp.ht. ΔT

For a pure substance, $\Delta H = \Sigma \Delta H$ for phase changes + $\Sigma n C_m \Delta T$

$\Delta H_{sum\ of\ steps} = \Sigma \Delta H_{steps}$ $\pi V = n R T$ $\pi = M R T$

$\Delta H^{o}_{rxn} = \Sigma \Delta H^{o}_{f,products} - \Sigma \Delta H^{o}_{f,reactants}$

$\lambda\nu = c$ where $c = 2.998 \times 10^{8}$ m/s

$E = h\nu = hc/\lambda$ where $h = 6.626 \times 10^{-34}$ J s

$\lambda = h/mv$ for particles

$U = - A Z^{+}Z^{-}/d$

$\Delta H = \Sigma D_{reactant\ bonds} - \Sigma D_{product\ bonds}$

1 atm = 760 torr

$P_1V_1 = P_2V_2$

$V_1T_2 = V_2T_1$

$P_1V_1/T_1 = P_2V_2/T_2$

$PV = nRT$ where R = 0.08206 L atm/mol K

$r_1/r_2 = (MM_2/MM_1)^{1/2}$

$KE = 1/2\ mv^2 = 3/2\ kT$

$\Delta T_f = i K_f m$ $\Delta T_b = i K_b m$

				H 2.1
B 2.0	C 2.5	N 3.0	O 3.5	F 4.0
Al 1.5	Si 1.8	P 2.1	S 2.5	Cl 3.0
Ga 1.6	Ge 1.8	As 2.0	Se 2.4	Br 2.8
In 1.7	Sn 1.8	Sb 1.9	Te 2.1	I 2.5
Tl 1.8	Pb 1.8	Bi 1.9	Po 2.0	At 2.2

Electronegativity values