Chem 1121
Spring 2012
Exam 2A

Name:_____

Show all work to receive credit. You must use the factor-label (conversion-factor) method for all conversions. Be sure to show all units and write your answers using the correct number of significant figures or decimal places.

Q1. [12 pts.] Identify the following compounds as being either IONIC (I) or MOLECULAR (M).

a) $FeBr_2$ _____

b) NO_2 _____

c) I_3Br_{10} _____

d) P_4O_{10} _____

e) $NaNO_3$ _____

f) K_2S _____

Q2. [16 pts.] Name the following compounds:

a) $FeCl_3$ _____

b) NH_4Br _____

c) N_3F_8 _____

d) $Cu(NO_3)_2$ _____

e) Br_2O_7 _____

f) Li_3PO_4 _____

g) $Ca(HCO_3)_2$ _____

h) P_4S_6 _____

Q3. [16 pts.] Write formulas for the following compounds:

a) calcium sulfate _____

b) trisulfur octabromide _____

c) ammonium carbonate _____

d) potassium nitrite _____

e) copper(II) hydroxide _____

f) heptanitrogen tetroxide _____

g) octaphosphorus trichloride _____

h) magnesium cyanide _____

Q4. [6 pts.] Give the name and the formula of the ion released by an ACID when it dissolves in water?

Q5. [12 pts.] Using the normal number of bonds that the atoms make, draw two different **structural isomers** with the formula: $C_2H_4Cl_2$. Explain what a structural isomer is part of your answer.

Q6. [20 pts.] Write out valid Lewis structures for the following substances:

a) CH_2Br_2

b) SO_3^{2-}

c) HCN

(hint: take carbon to be the central element.)

Q7. [18 pts.] Predict the geometry of the NF_3 molecule using VSEPR. Your answer should include:

(1) a valid Lewis structure, (2) a sketch of the geometry *(using line, wedge, and dash notation)*,
(3) the name of the **molecular** geometry, and
(4) the approximate bond angle written out.

Periodic Table

1 IA												13 IIIA	14 IVA	15 VA	16 VIA	17 VIIA	18 VIIIA
1 **H** 1.01	2 IIA																2 **He** 4.00
3 **Li** 6.94	4 **Be** 9.01											5 **B** 10.81	6 **C** 12.01	7 **N** 14.01	8 **O** 16.00	9 **F** 19.00	10 **Ne** 20.18
11 **Na** 22.99	12 **Mg** 24.31	3 IIIB	4 IVB	5 VB	6 VIB	7 VIIB	8	9 VIIIB	10	11 IB	12 IIB	13 **Al** 26.98	14 **Si** 28.09	15 **P** 30.97	16 **S** 32.07	17 **Cl** 35.45	18 **Ar** 39.95
19 **K** 39.1	20 **Ca** 40.08	21 **Sc** 44.96	22 **Ti** 47.88	23 **V** 50.94	24 **Cr** 52.00	25 **Mn** 54.94	26 **Fe** 55.85	27 **Co** 58.93	28 **Ni** 58.69	29 **Cu** 63.55	30 **Zn** 65.39	31 **Ga** 69.72	32 **Ge** 72.61	33 **As** 74.92	34 **Se** 78.96	35 **Br** 79.90	36 **Kr** 83.80
37 **Rb** 85.47	38 **Sr** 87.62	39 **Y** 88.91	40 **Zr** 91.22	41 **Nb** 92.91	42 **Mo** 95.94	43 **Tc** (98)	44 **Ru** 101.07	45 **Rh** 102.91	46 **Pd** 106.42	47 **Ag** 107.87	48 **Cd** 112.41	49 **In** 114.82	50 **Sn** 118.71	51 **Sb** 121.76	52 **Te** 127.6	53 **I** 126.9	54 **Xe** 131.29
55 **Cs** 132.9	56 **Ba** 137.3	57 **La*** 138.9	72 **Hf** 178.5	73 **Ta** 180.9	74 **W** 183.9	75 **Re** 186.2	76 **Os** 190.2	77 **Ir** 192.2	78 **Pt** 195.1	79 **Au** 197.0	80 **Hg** 200.6	81 **Tl** 204.4	82 **Pb** 207.2	83 **Bi** 209	84 **Po** (209)	85 **At** (210)	86 **Rn** (222)
87 **Fr** (223)	88 **Ra** (226)	89 **Ac^** (227)	104 **Rf** (261)	105 **Db** (262)	106 **Sg** (263)	107 **Bh** (264)	108 **Hs** (265)	109 **Mt** (268)	110 **Ds** (271)	111 **Rg** (272)							

*	58 **Ce** 140.1	59 **Pr** 140.9	60 **Nd** 144.2	61 **Pm** (145)	62 **Sm** 150.4	63 **Eu** 152.0	64 **Gd** 157.3	65 **Tb** 158.9	66 **Dy** 162.5	67 **Ho** 164.9	68 **Er** 167.3	69 **Tm** 168.9	70 **Yb** 173.0	71 **Lu** 175.0
^	90 **Th** 232.0	91 **Pa** (231)	92 **U** 238.0	93 **Np** (237)	94 **Pu** (244)	95 **Am** (243)	96 **Cm** (247)	97 **Bk** (247)	98 **Cf** (251)	99 **Es** (252)	100 **Fm** (257)	101 **Md** (258)	102 **No** (259)	103 **Lr** (260)