

CHEM 1215
Exam II
John II. Gelder
September 16, 1988

Name _____
TA's Name _____
Lab Section _____

INSTRUCTIONS:

1. This examination consists of a total of 4 different pages. The last page includes a periodic. All work should be done in this booklet.
2. PRINT your name, TA's name and your lab section number now in the space at the top of this sheet. **DO NOT SEPARATE THESE PAGES.** You will receive 2 points for knowing your TA's name AND laboratory section number in which you are officially enrolled.
3. Answer all questions that you can and whenever called for show your work clearly. Your method of solving problems should pattern the approach used in lecture. You do not have to show your work for the multiple choice (if any) or short answer questions.
4. No credit will be awarded if your work is not shown in problems .
5. Point values are shown next to the problem number.
6. Budget your time for each of the questions. Some problems may have a low point value yet be very challenging. If you do not recognize the solution to a question quickly, skip it, and return to the question after completing the easier problems.
7. Look through the exam before beginning; plan your work; then begin.
8. ~~Relax~~ and do well.

	Page 2	Page 3	Page 4	TOTAL
SCORES	<u> </u> (19)	<u> </u> (14)	<u> </u> (17)	<u> </u> (50)

- (5) 1. Write the ground state configuration for the following species;
- a) O
 - b) Cr
 - c) Sn
 - d) Er
 - e) Cl^-
- (6) 2. Provide an orbital diagram for each of the following species and determine the number of unpaired electrons. (NOTE: Use boxes or circles to represent the orbitals.)
- a) O
 - b) Mg
 - c) V
- (2) 3. Write the general valence shell electron configuration for the Boron group.
- (4) 4. Determine the number of electrons, protons and neutrons for each of the following species
- a) ${}^{14}_6\text{C}$ electrons _____ protons _____ neutrons _____
 - a) ${}^{209}_{82}\text{Pb}^{2+}$ electrons _____ protons _____ neutrons _____
- (2) 5. Write the isotopic notation for the isotope with 36 electrons, 33 protons and 41 neutrons.

- (4) 6. Using the space provided re-order the elements below;

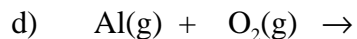
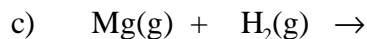
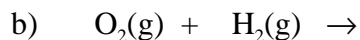
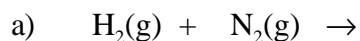
Br At F Cl I

from the largest to the smallest atomic radius;

from the largest to the smallest first ionization potential.

- (5) 7. Discuss ionic bonds and ionic compounds. In your discussion include a definition of an ionic bond, what classes of elements are involved in ionic bonding, the two processes which are important for the formation of an ionic bond (you may use an example), some examples of physical properties (at least two) characteristic to ionic compounds.

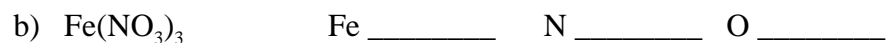
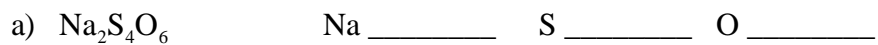
- (5) 8. Write the formula of the compound which is most likely formed when the following elements are combined. balance the resulting equation and specify the physical state of the product at room temperature.



(6) 9. Draw the Lewis electron dot structure for the following molecules



(4) 10. Determine the oxidation state for each of the elements in the following compounds



(7) 10. Complete the following table by inserting the name of a compound or a formula.

Compound Name	Formula
	Cr_2O_3
dichlorine monoxide	
	HBr(g)
nitric acid	
	$HClO_4$
calcium phosphate	
potassium hydroxide	

Periodic Table of the Elements

	IA																VIII A	
1	1 H 1.008	IIA										IIIA	IVA	VA	VIA	VIIA	2 He 4.00	
2	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	
3	11 Na 22.99	12 Mg 24.30	IIIB	IVB	VB	VIB	VIIB	VIII			IB	IIB	13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.06	17 Cl 35.45	18 Ar 39.95
4	19 K 39.10	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 65.38	31 Ga 69.72	32 Ge 72.59	33 As 74.92	34 Se 78.96	35 Br 79.90	36 Kr 83.80
5	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 101.1	45 Rh 102.9	46 Pd 106.4	47 Ag 107.9	48 Cd 112.4	49 In 114.8	50 Sn 118.7	51 Sb 121.8	52 Te 127.6	53 I 126.9	54 Xe 131.3
6	55 Cs 132.9	56 Ba 137.3	57 La 138.9	72 Hf 178.5	73 Ta 180.9	74 W 183.8	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 209.0	84 Po (209)	85 At (210)	86 Rn (222)
7	87 Fr (223)	88 Ra 226.0	89 Ac 227.0	104 Rf (261)	105 Db (262)	106 Sg (263)	107 Bh (262)	108 Hs (265)	109 Mt (266)									

Lanthanides	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 157.2	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
Actinides	90 Th 232.0	91 Pa 231.0	92 U 238.0	93 Np 237.0	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)