Chemistry 121B Hanson **EXAM 1** **Sept. 26, 2016**

Name_____

NOTE: To receive credit, show your work.
If you feel strapped for time, try to at least *start* each problem before going on to the next.

PLEASE DO NOT OPEN THE EXAM UNTIL INSTRUCTED TO DO SO

1 1A																	18 8A
1 **H** 1.008	2 2A											13 3A	14 4A	15 5A	16 6A	17 7A	**2** **He** 4.003
3 **Li** 6.941	**4** **Be** 9.012											**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 3B	4 4B	5 5B	6 6B	7 7B	8	9 8B	10	11 1B	12 2B	**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** 39.10	**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** 65.39	**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** 127.60	**53** **I** 126.90	**54** **Xe** 131.29
55 **Cs** 132.91	**56** **Ba** 137.33	**71** ***Lu** 174.97	**72** **Hf** 178.49	**73** **Ta** 180.95	**74** **W** 183.85	**75** **Re** 186.21	**76** **Os** 190.2	**77** **Ir** 192.22	**78** **Pt** 195.08	**79** **Au** 196.97	**80** **Hg** 200.59	**81** **Tl** 204.38	**82** **Pb** 207.2	**83** **Bi** 208.98	**84** **Po** (209)	**85** **At** (210)	**86** **Rn** (222)
87 **Fr** (223)	**88** **Ra** 226.03	**103** **†Lr** (260)	**104** **Rf** (261)	**105** **Db** (260)	**106** **Sg** (263)	**107** **Bh** (262)	**108** **Hs** (265)	**109** **Mt** (266)	**110** ?	**111** ?	**112** ?		**114** ?		**116** ?		**118** ?

*Lanthanide Series	**57** **La** 138.91	**58** **Ce** 140.12	**59** **Pr** 140.91	**60** **Nd** 144.24	**61** **Pm** (145)	**62** **Sm** 150.36	**63** **Eu** 151.96	**64** **Gd** 157.25	**65** **Tb** 158.93	**66** **Dy** 162.50	**67** **Ho** 164.93	**68** **Er** 167.26	**69** **Tm** 168.93	**70** **Yb** 173.04
†Actinide Series	**89** **Ac** 227.03	**90** **Th** 232.04	**91** **Pa** 231.04	**92** **U** 238.03	**93** **Np** 237.05	**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)

(20) 1. Vocabulary. Define **and give one example** of each:

a. physical change

b. homogeneous mixture

c. accuracy vs. precision (explain, and provide an example of a precise measurement that is not very accurate)

d. law of constant proportion (law of definite composition)

e. isotope

f. isomer

g. chemical compound

h. ionic compound

i. empirical formula vs. molecular formula

/20

(10) 2. Indicate the number of significant digits (perhaps "infinite") in each of the following cases, and express the number in scientific notation:

a. 0.0000350

b. 380.00

c. 10.05

d. 12 eggs in a dozen

e. 30.48 centimeters per foot

(20) 3. Express each of the following in the designated units. Be sure to SHOW YOUR WORK

a. 2.46 mm in nm.

b. 55 mph in km/s [1 mile = 5280 ft; 12 in = 1 foot; 2.54 cm = 1 in]

c. 0.00015 g/mL in kg/m^3

/30

(15) 4. Fill in the blanks below relating to the symbol, number of protons, neutrons, electrons and overall charge of the following isotopes:

symbol	protons	neutrons	electrons	charge
^{3}H				0
	21	26	18	
$^{32}P^{3-}$				
$^{18}O^{2-}$				
	20	21		2+

(10) 5. Give the name of each ion or compound:

a. Ti^{4+} _____

b. Mg^{2+} _____

c. SF_6 _____

d. CrS_3 _____

e. N_2O_4 _____

(10) 6. Give the formula of each ion or compound:

a. iron(III) oxide _____

b. calcium hydride _____

c. tungsten(V) phosphide _____

d. iodine heptachloride _____

e. aluminum oxide _____

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(15) 6. In each incident case below, indicate which principles of laboratory safety (using one or more of the letters R, A, M, and P) were not followed sufficiently, in your opinion. Briefly explain your choice and reflect upon how that incident could have been prevented.

a. Jolene was working at the lab bench, tipped over an open bottle of concentrated acid, and burned her arm.

b. Jasper, not understanding the proper use of a volumetric pipette, proceeded to jam the pipette through his hand while trying to force the plastic bulb onto it.

c. Report to supervisor: *Last Friday, April 16, 1943, I was forced to stop my work in the laboratory in the middle of the afternoon and to go home, as I was seized by a peculiar restlessness associated with a sensation of mild dizziness. On arriving home, I lay down and sank into a kind of drunkenness which was not unpleasant and which was characterized by extreme activity of imagination. As I lay in a dazed condition with my eyes closed (I experienced daylight as disagreeably bright) there surged upon me an uninterrupted stream of fantastic images of extraordinary plasticity and vividness and accompanied by an intense, kaleidoscope-like play of colors. This condition gradually passed off after about two hours.* [discovery of LSD]

PLEDGE: I pledge my honor that on this examination I have neither given nor received assistance not explicitly approved by the professor and that I have seen no dishonest work.

[ ] I intentionally did not sign the pledge. Signature_____