Chemistry 1441-003
Test #1
Zumdahl, Chapters 1 and 2
June 8, 2004

Name (please print)_____
Last Name First Name

IA												IIIA	IVA	VA	VIA	VIIA	VIIIA
1 H 1.01	IIA									IB	IIB						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 15.999	9 F 18.998	10 Ne 20.18
11 Na 22.99	12 Mg 24.31	IIIB	IVB	VB	VIB	VIIB	VIIIB					13 Al 26.98	14 Si 28.086	15 P 30.97	16 S 32.06	17 Cl 35.45	18 Ar 39.95
19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.90	23 V 50.94	24 Cr 51.996	25 Mn 54.94	26 Fe 55.85	27 Co 58.93	28 Ni 58.70	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
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 106.4	47 Ag 107.87	48 Cd 112.41	49 In 114.82	50 Sn 118.69	51 Sb 121.75	52 Te 127.60	53 I 126.90	54 Xe 131.30
55 Cs 132.91	56 Ba 137.33	57 La 138.91	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 195.09	79 Au 196.97	80 Hg 200.59	81 Tl 204.37	82 Pb 207.2	83 Bi 208.98	84 Po (209)	85 At (210)	86 Rn (222)
87 Fr (223)	88 Ra 226.03	89 Ac 227.03	104 Unq (261)	105 Unp (262)	106 Unh (263)												

58 Ce 140.12	59 Pr 140.91	60 Nd 144.24	61 Pm (145)	62 Sm 150.4	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	71 Lu 174.97
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)	103 Lr (260)

Instructions:

1. This exam consists of **23** questions.
2. No scratch paper is allowed. You may do the work in the test margins and on the backs of the test pages.
3. Mark the answers you choose on the test itself for your own information and also on the standard answer sheet you provided. Scoring will be based on the answer sheet.
4. When you finish, turn in both the test form and the answer form. Write your name on both forms.

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1. A student determined the mass of a sample contained in a beaker by subtracting the mass of the beaker alone (74.8 g) from the mass of the beaker containing the sample (75.652 g). How many significant figures should be reported for the mass of the sample?

   a) 1
   b) 2
   c) 3
   d) 4
   e) 5

2. When the following calculation is performed, how many significant figures will the answer have?

$$\frac{1.900 + 0.0200}{23.75 + 0.25} + 0.06223 = ???$$

   a) 1
   b) 2
   c) 3
   d) 4
   e) 5

3. The number of electrons in a neutral atom of an element is always equal to the _____ of the element.

a. mass number
b. atomic number
c. atomic mass unit
d. isotope number
e. Avogadro's number

4. What is the symbol of the species that has 18 electrons, 20 neutrons and 19 protons?

a. $^{19}Ca^{2+}$
b. $^{39}Ca^{2+}$
c. $^{20}K^{+}$
d. $^{39}K^{-}$
e. $^{39}K^{+}$

5. The formula for europium oxide is Eu_2O_3. On the basis of this information, the formula for the nitrate of europium would be

a. $Eu(NO_3)_2$
b. EuN_2
c. Eu_2N_3
d. $Eu(NO_3)_3$
e. $Eu(NO_2)_3$

6. All of the following elements occur as diatomic molecules except

a. sulfur
b. oxygen
c. fluorine
d. nitrogen
e. chlorine

7. What is the result of the following calculation, expressed to the appropriate number of significant figures?

$$5.923 \times 10^{-7} + 8.72 \times 10^{-8} + 9.735 \times 10^{-7}$$

a. 1.6530×10^{-6}
b. 1.653×10^{-6}
c. 1.65×10^{-6}
d. 2.44×10^{-7}
e. 1.65×10^{-5}

8. Convert 37.5 nm to cm.

a) 3.75×10^{-4} cm
b) 3.75×10^{-5} cm
c) 3.75×10^{-6} cm
d) 3.75×10^{-7} cm
e) 3.75×10^{8} cm

9. What is the formula of magnesium chlorite?

a) $Mg(ClO_3)_2$
b) $MgClO_3$
c) $MgCl_2$
d) $Mg(ClO_2)_2$
e) $MgClO_2$

10. Which of the following name/formula combinations is/are correct?

I.	$Ca(CN)_2$	calcium cyanide
II.	Fe_2O_3	iron(II) oxide
III.	$Al_2(SO_4)_3$	aluminum sulfate
IV.	$(NH_4)_3PO_4$	ammonium phosphate
V.	$KMnO_4$	potassium permanganate

a) none of these
b) I and V
c) II and III
d) I, III, IV, and V
e) I, II, III, IV, and V

11. The density of tungsten is 19.3 g/cm^3. Express this value in lb/ft^3.

a) 1.30 lb/ft^3
b) 4.04×10^4 lb/ft^3
c) 879 lb/ft^3
d) 942 lb/ft^3
e) 1.21×10^3 lb/ft^3

12. Place the sub atomic particles in order of increasing mass.

a) $p = e^- < n$
b) $p < e^- < n$
c) $e^- < n = p$
d) $e^- < n < p$
e) $e^- < p < n$

13. Which of the compounds listed below are ionic?

I.	$MgCl_2$
II.	P_2O_5
III.	HBr
IV.	NH_4NO_3

a) I only
b) I and III
c) I, III and IV
d) I and IV
e) I, II, III, and IV

14. Which of the following compounds is/are <u>correctly</u> named?

I.	Na_2O_2	sodium peroxide
II.	NH_4HCO_3	ammonium bicarbonate
III.	Hg_2Cl_2	mercury(I) chloride
IV.	SnO_2	tin(IV) oxide

a) I
b) I and III
c) II and IV
d) I, II, and IV
e) I, II, III, and IV

15. Which of the following acids is <u>incorrectly</u> named?

a) HNO_2 nitrous acid
b) HCN hydrocyanic acid
c) H_2SO_3 hydrosulfurous acid
d) HF hydrofluoric acid
e) $HClO_4$ perchloric acid

16. What is the symbol for lead?

a) Pb
b) L
c) Le
d) Au
e) Hg

17. An empty vial weighs 31.45 g. If the vial weighs 179.56 g when filled with liquid mercury ($d = 13.53\ g/cm^3$), what is its volume?

a. $2.003 \times 10^3\ cm^3$
b. $13.27\ cm^3$
c. $5.279\ cm^3$
d. $9.135 \times 10^{-2}\ cm^3$
e. $10.95\ cm^3$

18. Convert 2.75 dL to µL.

a) 2.75×10^4 µL
b) 2.75×10^{-7} µL
c) 2.75×10^6 µL
d) 2.75×10^{-5} µL
e) 2.75×10^5 µL

19. An experiment was performed to determine the density of dry sand and the density of sand particles. An empty 100 mL graduated cylinder was weighed. It was weighed once again after it had been filled to the 10.0 mL mark with dry sand. A 10 mL pipet was used to transfer 10.00 mL of methanol to the cylinder. The sand-methanol mixture was stirred until bubbles no longer emerged from the mixture and the sand looked uniformly wet. Use the data from this experiment below to calculate the density of the dry sand and the density of the sand particles.

Mass of cylinder plus wet sand	43.4827 g
Mass of cylinder plus dry sand	34.7332 g
Mass of empty cylinder	20.8713 g
Volume of dry sand	10.0 mL
Volume of sand + methanol	15.8 mL
Volume of methanol	10.00 mL

	<u>density of dry sand</u>	<u>density of sand particles</u>
a)	2.26 g/mL	3.7 g/mL
b)	2.26 g/mL	1.4 g/mL
c)	1.39 g/mL	2.4 g/mL
d)	1.39 g/mL	3.7 g/mL
e)	1.39 g/mL	1.4 g/mL

20. What is the symbol for mercury?

a) Me
b) M
c) Hg
d) Pb
e) W

21. Which of the following compounds is/are <u>incorrectly</u> named?

I.	$Fe_2(CO_3)_3$	iron(III) carbonate
II.	$CaCl_2$	calcium dichloride
III.	HNO_2	nitrous acid
IV.	N_2O_5	dinitrogen pentoxide

a) I only
b) II only
c) I and II
d) II and IV
e) I, II, and III

22. The formula of bromic acid is

a) HBr
b) $HBrO_4$
c) $HBrO_3$
d) $HBrO_2$
e) HBrO

23. Which of the following elements is an alkaline earth metal?

a) Na
b) Ca
c) Fe
d) Ce
e) Th

Answer Key:

1. a	6. a	11. e	16. a	21. b
2. e	7. a	12. e	17. e	22. c
3. b	8. c	13. d	18. e	23. b
4. e	9. d	14. e	19. c	
5. d	10. d	15. c	20. c	