

Chem 10113, Quiz 1

August 29, 2018

Name: _____

(Please Print)

Pay attention to significant figures in all calculations!

	IA (1)																VIIIA (18)	
1	1 H 1.0080	IIA (2)										III A (13)	IV A (14)	VA (15)	VIA (16)	VII A (17)	2 He 4.0026	
2	3 Li 6.9410	4 Be 9.0122										5 B 10.811	6 C 12.011	7 N 14.007	8 O 15.999	9 F 18.998	10 Ne 20.179	
3	11 Na 22.990	12 Mg 24.305	IIIB (3)	IVB (4)	VB (5)	VIB (6)	VII B (7)	VIII B (8)	IX B (9)	X B (10)	XI B (11)	XII B (12)	13 Al 26.982	14 Si 28.086	15 P 30.974	16 S 32.066	17 Cl 35.453	18 Ar 39.948
4	19 K 39.098	20 Ca 40.078	21 Sc 44.956	22 Ti 47.880	23 V 50.942	24 Cr 51.996	25 Mn 54.938	26 Fe 55.847	27 Co 58.933	28 Ni 58.690	29 Cu 63.546	30 Zn 65.380	31 Ga 69.723	32 Ge 72.610	33 As 74.922	34 Se 78.960	35 Br 79.904	36 Kr 83.800
5	37 Rb 85.468	38 Sr 87.620	39 Y 88.906	40 Zr 91.224	41 Nb 92.906	42 Mo 95.940	43 Tc 98.907	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 121.75	52 Te 127.60	53 I 126.90	54 Xe 131.29
6	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 190.20	77 Ir 192.22	78 Pt 195.09	79 Au 196.97	80 Hg 200.59	81 Tl 204.38	82 Pb 207.20	83 Bi 208.98	84 Po 208.98	85 At 209.99	86 Rn 222.02
7	87 Fr 223.02	88 Ra 226.03	89 Ac 227.03	104 Unq 261.11	105 Unp 262.11	106 Unh 263.12	107 Uns 262.12											

- (6 points) **SHOW ALL WORK.** An atom of cesium (Cs) has a radius of 256 pm (*picometer*). Imagine a string of individual Cs atoms laid edge to edge in a straight line like a row of golf balls. Determine the length (in inches) of a line of Cs atoms that could be made from a 75.0 fg (*femtogram*) sample of pure cesium. (*Note:* You must use the *mole concept* correctly in order to receive any credit for this problem.)

- (3 points) Complete the following calculation (assume all values are measured quantities). Write the answer in proper *scientific notation*, rounded to the *correct number of significant figures*.

$$\frac{(6.07325 \times 10^{11})(54.790 - 6.582)}{(0.87 + 3.531)^2 (7.1738 \times 10^{-4})} =$$

3. (3 points) **SHOW ALL WORK.** The ratio of fluorine to antimony by mass in SbF_3 is 0.332:1.00. Determine the formula of another fluoride of antimony in which the mass ratio of fluorine to antimony is 0.553:1.00. This data illustrates Dalton's Law of _____.
4. (6 points) **SHOW ALL WORK.** Aerogels are the most porous, lightest, solid materials known. A certain aerogel has a specific gravity of 0.00195. Determine the mass in pounds (lb) of an SUV size block of this aerogel that has a volume of 524 ft^3 .
5. The element copper (Cu) has two naturally occurring isotopes: ^{63}Cu and ^{65}Cu . The isotope ^{63}Cu has a mass of 62.9296 amu and a natural abundance of 69.17 %.
- (a) (2 points) One atom of $^{65}\text{Cu}^{2+}$ contains _____ protons, _____ neutrons, and _____ electrons.
- (b) (5 points) **SHOW ALL WORK.** Determine the mass of the ^{65}Cu isotope in amu.