

Chemistry 121
Fall 2006
Test 1

Instructions: You have 50 minutes to complete this 100-point exam. All answers must be written on the blue Test Answer Sheet. You may use a simple scientific calculator. No programmable calculators allowed.

I. Multiple Choice (10 pts) Carefully and clearly circle the best answer on the Test Answer Sheet.

- Which of the following elements has properties similar to strontium?
 - Potassium
 - Rubidium
 - Yttrium
 - Calcium
- Which of the following elements is in the 2nd period of the periodic table?
 - Na
 - C
 - He
 - Mg
- Which of the following elements is a noble gas?
 - N
 - O
 - F
 - Ne
- Elements that gain electrons are called:
 - Anions
 - Cations
 - Metals
 - None of the above
- In a chemical reaction, _____ are consumed.
 - Products
 - Reactants
 - Metalloids
 - None of the above

II. Chemical Formulas, Naming, Atomic Notation and Significant Figures

- (20 pts) Give the chemical formulas for the following:
 - Cadmium(II) sulfate
 - Nitrogen trichloride
 - Krypton hexafluoride
 - Magnesium hydrogen sulfite
 - Chromium(III) nitrate
 - Selenium disulfide
 - Aluminum hydroxide
 - Beryllium nitride
 - Carbon tetrabromide
 - Potassium carbonate
- (20 pts) Name the following:
 - Li_3N
 - SO_3
 - Cu_2SO_4
 - RbCl
 - SBr_2
 - $(\text{NH}_4)_3\text{PO}_4$
 - TiO_2
 - $\text{Ca}(\text{C}_2\text{H}_3\text{O}_2)_2$
 - PF_3
 - MgCr_2O_7
- (6 pts) Fill in the blanks:

Symbol	Name	# of protons	# of neutrons	Mass Number
8a	Zirconium	8b	52	8c
Sc	8d	8e	8f	46

- (4 pts) Indicate the number of significant figures in the following measurements.
 - 280 g
 - 0.9050 L
 - 1.80 cm^3
 - 55.690 atoms

III. Calculations: Show all work on the blue Test Answer Sheet. Partial credit will be given for correct work. If I cannot read the work, it will not be graded.

10. (10 pts) Convert 2.48 lb to g. (1 kg = 2.205 lb)

11. (15 pts) Convert 540 m/s to ft/min. (1 m = 39.37 in)

12. (15 pts) At room temperature, the density of mercury is 13.5 g/mL. What is the volume of mercury in milliliters of a sample of mercury that weighs 15.1 lb. (1 kg = 2.205 lb)

IV. ESSAY QUESTION (worth 10 pts): In 4 – 6 complete sentences, answer **ONE** of the following essay questions.

- Describe how Millikan determined the charge on one electron.
- Explain how a mass spectrometer works.

	IA																										VIIIA
1	1															2	2										
	H															He											
	1.008															4.00											
2	3	4											5	6	7	8	9	10									
	Li	Be											B	C	N	O	F	Ne									
	6.94	9.01											10.81	12.01	14.01	16.00	19.00	20.18									
3	11	12											13	14	15	16	17	18									
	Na	Mg											Al	Si	P	S	Cl	Ar									
	22.99	24.31											26.98	28.09	30.97	32.06	35.45	39.95									
4	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36									
	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr									
	39.10	40.08	44.96	47.90	50.94	52.00	54.94	55.85	58.93	58.71	63.55	65.37	69.72	72.59	74.92	78.96	79.90	83.80									
5	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54									
	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe									
	85.47	87.62	88.91	91.22	92.91	95.94	[98]	101.1	102.9	106.4	107.9	112.40	114.8	118.7	121.8	127.60	126.90	131.30									
6	55	56	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86									
	Cs	Ba	Lu	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn									
	132.9	137.3	175	178.5	181	183.9	186.2	190.2	192.2	195.1	197	200.59	204.4	207.2	209	[209]	[210]	[222]									
7	87	88	103	104	105	106																					
	Fr	Ra	Lr																								
	[223]	[226]	[262]	[261]	[262]	[263]																					
57	58	59	60	61	62	63	64	65	66	67	68	69	70														
La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb														
138.9	140.1	140.9	144.2	[145]	150.4	152	157.3	158.9	162.5	164.93	167.3	168.9	173														
89	90	91	92	93	94	95	96	97	98	99	100	101	102														
Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No														
[227]	232	[231]	238	[237]	[244]	[243]	[247]	[247]	[251]	[252]	[257]	[258]	[259]														