

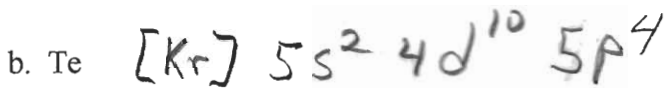
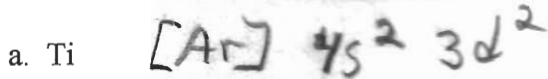
Key

$c = v\lambda$ $E = hv$ $E = mc^2$ $c = 3.00 \times 10^8$ m/s $h = 6.626 \times 10^{-34}$ J·s

1. (6 Pts) Determine if each of the following ions or atoms are paramagnetic or diamagnetic.

a. sodium	Paramagnetic	b. S^{2-}	diamagnetic
c. V	Paramagnetic	d. Ca^{2+}	diamagnetic
e. Fe	Paramagnetic	f. Fe^{2+}	paramagnetic

2. (6 Pts) Write out the **SHORTHAND** electron configuration for each of the following:



3. (3 Pts) Write out the **COMPLETE** electron configuration for phosphorus.



4. (6 Pts) Circle the atom or ion with the largest diameter in each of the following sets.

- a. Na, K, or Ca b. N, O, or F c. Cl, Ar, or K^+

5. (2 Pts) Which element would have a higher ionization energy, Na or Rb? Na Justify your answer:

They are both in Group 1a, but Na is smaller so e^- is held more tightly.

6. (2 Pts) Calculate the frequency of red light with a wavelength of 700 nm.

$c = v\lambda$ $v = \frac{c}{\lambda}$
 $v = \frac{3.00 \times 10^8 \text{ m/s}}{700 \times 10^{-9} \text{ m}}$

$v = 4.29 \times 10^{14} \text{ s}^{-1}$

1 H 1.008	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											13 Al 26.98	14 Si 28.09	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 47.88	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 98.91	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																		
55 Cs 132.9	56 Ba 137.3	57 La 138.9	58 Ce 140.1	59 Pr 140.9	60 Nd 145.0	61 Pm 144.9	62 Sm 150.4	63 Eu 152.0	64 Gd 157.3	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																			
87 Fr 223	88 Ra 226	89 Ac 227															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					