

Name: _____

ID: _____ - _____ - _____

The Periodic Table

<i>IA</i> H 1 1.01																	<i>VIIIA</i> He 2 4.00
<i>IA</i> Li 3 6.94	<i>IIA</i> Be 4 9.01											<i>IIIA</i> B 5 10.81	<i>IVA</i> C 6 12.01	<i>VA</i> N 7 14.01	<i>VIA</i> O 8 16.00	<i>VIIA</i> F 9 19.00	<i>VIIIA</i> Ne 10 20.18
Na 11 22.99	Mg 12 24.31											Al 13 26.98	Si 14 28.09	P 15 30.97	S 16 32.07	Cl 17 35.45	Ar 18 39.95
K 19 39.10	Ca 20 40.08	<i>IIIB</i> Sc 21 44.96	<i>IVB</i> Ti 22 47.88	<i>VB</i> V 23 50.94	<i>VIB</i> Cr 24 52.00	<i>VIB</i> Mn 25 54.94	<i>VIB</i> Fe 26 55.85	<i>VIB</i> Co 27 58.93	<i>VIB</i> Ni 28 58.69	<i>IB</i> Cu 29 63.55	<i>IB</i> Zn 30 65.39	Ga 31 69.72	Ge 32 72.61	As 33 74.92	Se 34 78.96	Br 35 79.90	Kr 36 83.80
Rb 37 85.47	Sr 38 87.62	Y 39 88.91	Zr 40 91.22	Nb 41 92.91	Mo 42 95.94	Tc 43 (97.9)	Ru 44 101.07	Rh 45 102.91	Pd 46 106.42	Ag 47 107.87	Cd 48 112.41	In 49 114.82	Sn 50 118.71	Sb 51 121.76	Te 52 127.60	I 53 126.90	Xe 54 131.29
Cs 55 132.91	Ba 56 137.33	La 57 138.91	Hf 72 178.49	Ta 73 180.95	W 74 183.85	Re 75 186.21	Os 76 190.2	Ir 77 192.22	Pt 78 195.08	Au 79 197.97	Hg 80 200.59	Tl 81 204.38	Pb 82 207.2	Bi 83 208.98	Po 84 (209)	At 85 (210)	Rn 86 (222)
Fr 87 223.02	Ra 88 226.03	Ac 89 227.03	Rf 104 (261)	Db 105 (262)	Sg 106 (263)	Bh 107 (262)	Hs 108 (265)	Mt 109 (266)									

Ce 58 140.12	Pr 59 140.91	Nd 60 144.24	Pm 61 (145)	Sm 62 150.36	Eu 63 152.07	Gd 64 157.25	Tb 65 158.93	Dy 66 162.50	Ho 67 164.93	Er 68 167.26	Tm 69 168.93	Yb 70 173.04	Lu 71 174.97
Th 90 232.04	Pa 91 231.04	U 92 238.03	Np 93 237.05	Pu 94 (240)	Am 95 243.06	Cm 96 (247)	Bk 97 (248)	Cf 98 (251)	Es 99 252.08	Fm 100 257.10	Md 101 (257)	No 102 259.10	Lr 103 262.11

Useful Information

- $N = 6.02 \times 10^{23} \text{ mol}^{-1}$
- $h = 6.626 \times 10^{-34} \text{ J}\cdot\text{s}$
- $c = 2.998 \times 10^8 \text{ m/s}$
- $\lambda\nu = c$
- $E = h\nu$
- Density = m/v

Question 1 Fill in the blanks in the following table:

8 Points

Symbol		$^{65}\text{Cu}^{2+}$
# Protons	16	
# Neutrons	16	
# Electrons	18	

Question 2 Lithium has two naturally occurring isotopes:

5 Points

	Mass	Abundance
^6Li	6.0151 amu	7.50%
^7Li	7.0160 amu	92.50%

Determine the average Molar Mass of Lithium. **[Show Work]**

Question 3 Use the Periodic Table accompanying this exam to answer the following questions:

10 Points

1. Name the element in the 2nd period of Group VI A. _____
2. Name the lightest Alkali Earth element. _____
3. Give the symbol of the Halogen in the 5th period. _____
4. Group 11A Metals like to have what charge _____
5. Group VII I A are collectively referred to as: _____

Question 4 One of the salts given below is not soluble in water. Circle it and give a brief explanation as to why this might be so?

5 Points



Question 5 An experiment calls for the use of 0.125 moles of sodium. How many grams is this?

4 Points

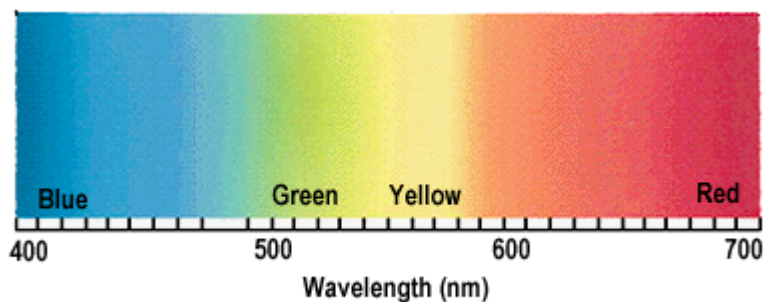
[Show Work]

Question 6 Analysis of Cr_xO_y showed that it contained 68.4% Cr. What is the charge on the Chromium in this oxide? **[Show Work]**

6 Points

Question 7

5 Points



With respect to the green region of the visible spectrum depicted above:
Circle those that apply.

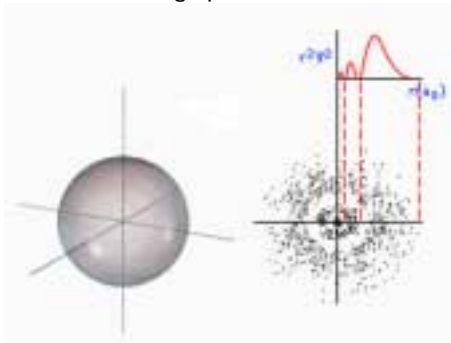
1. The color(s) with a greater frequency is/are: Blue Yellow Red
2. The color(s) with a lower energy is/are: Blue Yellow Red
3. The color(s) with a longer wavelength is/are: Blue Yellow Red

Question 8 An FM radio broadcasts @ 8.89×10^7 Hz. What wavelength does this correspond to? **[Show Work]**

6 Points

Question 9 The following question refer to the orbital depicted below:

9 Points



1. This is what type of orbital? _____
(I am looking for the letter designation)
2. What value of n is associated with this? _____
3. What is the total number of orbitals that can have this n value? _____

Question 10 Aluminum emits light with a wavelength of 396.15 nm ($1 \text{ nm} = 1 \times 10^{-9} \text{ m}$). What is the energy associated with one photon of this light.

6 Points

[Show Work]

Question 11 An unknown organic compound is found to be 74.0% C, 8.70% H and 17.30% N. It's molar mass is $162.0 \text{ g}\cdot\text{mol}^{-1}$. What is the molecular formula of this compound?

6 Points

[Show Work]

Question 12 Give the correct name for each of the following ionic compounds.

8 Points

1. $\text{Fe}_2(\text{SO}_4)_3$ _____

2. $\text{Al}(\text{OH})_3$ _____

3. NaClO_2 _____

4. K_3P _____

Question 13 Give the correct formula for each of the following ionic compounds.

8 Points

1. Ammonium chloride _____

2. Iron(III) oxide _____

3. Potassium dichromate _____

4. Magnesium cyanide _____

Question 14 Give the correct formula for each of the following:

8 Points

1. Nitric acid _____

2. Perchloric acid _____

3. Lithium hydroxide _____

4. Sulfuric acid _____

Question 15 Balance the following chemical equations:

6 Points

1. $__\text{Cr}(\text{s}) + __\text{Cl}_2(\text{g}) = __\text{CrCl}_3(\text{s})$

2. $__\text{Fe}(\text{s}) + __\text{H}_2\text{O}(\text{g}) = __\text{Fe}_3\text{O}_4(\text{s}) + __\text{H}_2(\text{g})$

3. $__\text{C}_2\text{H}_5\text{OH}(\text{l}) + __\text{O}_2(\text{g}) = __\text{CO}_2(\text{g}) + __\text{H}_2\text{O}(\text{g})$