

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

## Study Guide: Chapter 4 & 5

1. Fill in the missing information for each of the elements listed below:

Element Name	Symbol	Mass Number	Protons/Atomic #	Neutrons	Electrons	Valence Electrons
Potassium						
	Al					
		83.8				
			11			

2. List the 6 major models of the atom. Match the model with the description: *(Has a cloud where the electrons are, looks like planets going around the sun, is a solid sphere, all the mass is in the nucleus, sphere that can't be cut, has a positive particle in negative soup).*

Model : \_\_\_\_\_ Description: \_\_\_\_\_

Model : \_\_\_\_\_ Description: \_\_\_\_\_

Model : \_\_\_\_\_ Description: \_\_\_\_\_

Model : \_\_\_\_\_ Description: \_\_\_\_\_

Model : \_\_\_\_\_ Description: \_\_\_\_\_

Model : \_\_\_\_\_ Description: \_\_\_\_\_

3. Match the following with the group/family.

\_\_\_\_\_, \_\_\_\_\_ Halogens      A) Very reactive non-metal  
\_\_\_\_\_, \_\_\_\_\_ Noble Gases      B) Very reactive metal  
\_\_\_\_\_, \_\_\_\_\_ Alkali Metals      C) Stable non-metal

- 1) 8 or 18 valence electrons
- 2) 7 or 17 valence electrons
- 3) 1 valence electrons

4. Transitions metal are located \_\_\_\_\_ on the periodic table and change from metallic to dull as you go from \_\_\_\_\_ to \_\_\_\_\_ across the periodic table.

5. Draw a model (like we've done in class) of the element Carbon. Label all the components (proton, neutron, electron, nucleus, and their charges).

P= \_\_\_\_\_

E= \_\_\_\_\_

N= \_\_\_\_\_

6. The \_\_\_\_\_ and \_\_\_\_\_ make up most of the mass of the atom.

7. The \_\_\_\_\_ and \_\_\_\_\_ balance each other out in a stable (no charge) atom.

8. Explain the periodic law and its usefulness/purpose.

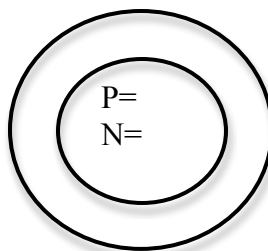
9. Ionization is the process of adding or taking away of \_\_\_\_\_ to an atom, which form an ion.

10. Draw a picture of the ion  $F^{-1}$  and label all the components. How many Protons, Neutrons and Electrons make up  $F^{-1}$ .

P= \_\_\_\_\_

N= \_\_\_\_\_

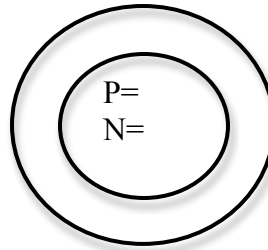
E= \_\_\_\_\_



11. An isotope is an atom with extra \_\_\_\_\_.

12. Draw a picture of the  $C_{14}$ . How many Protons, Neutrons and Electrons make up  $C_{14}$ . This atom is an \_\_\_\_\_ of Carbon, because it has \_\_\_\_\_ extra neutrons.

Protons = \_\_\_\_\_  
 Electrons = \_\_\_\_\_  
 Neutrons = \_\_\_\_\_



13. What are the properties of all metals?

14. What are the properties of all non-metals?

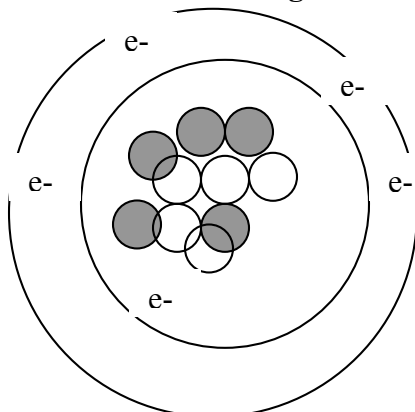
15. What are the properties of all metalloids (semiconductors)?

16. A \_\_\_\_\_ or \_\_\_\_\_ have increasing number of protons and electrons as you move left to right (horizontally) on the periodic table, they also don't have similar properties.

17. \_\_\_\_\_ or \_\_\_\_\_ are columns (vertically) in the periodic table and have similar properties.

18. There are \_\_\_\_\_ electrons in the 1<sup>st</sup> energy level, \_\_\_\_\_ electrons in the 2<sup>nd</sup> energy level, and \_\_\_\_\_ electrons in the 3<sup>rd</sup> energy level.

19. Label the following for the atom:

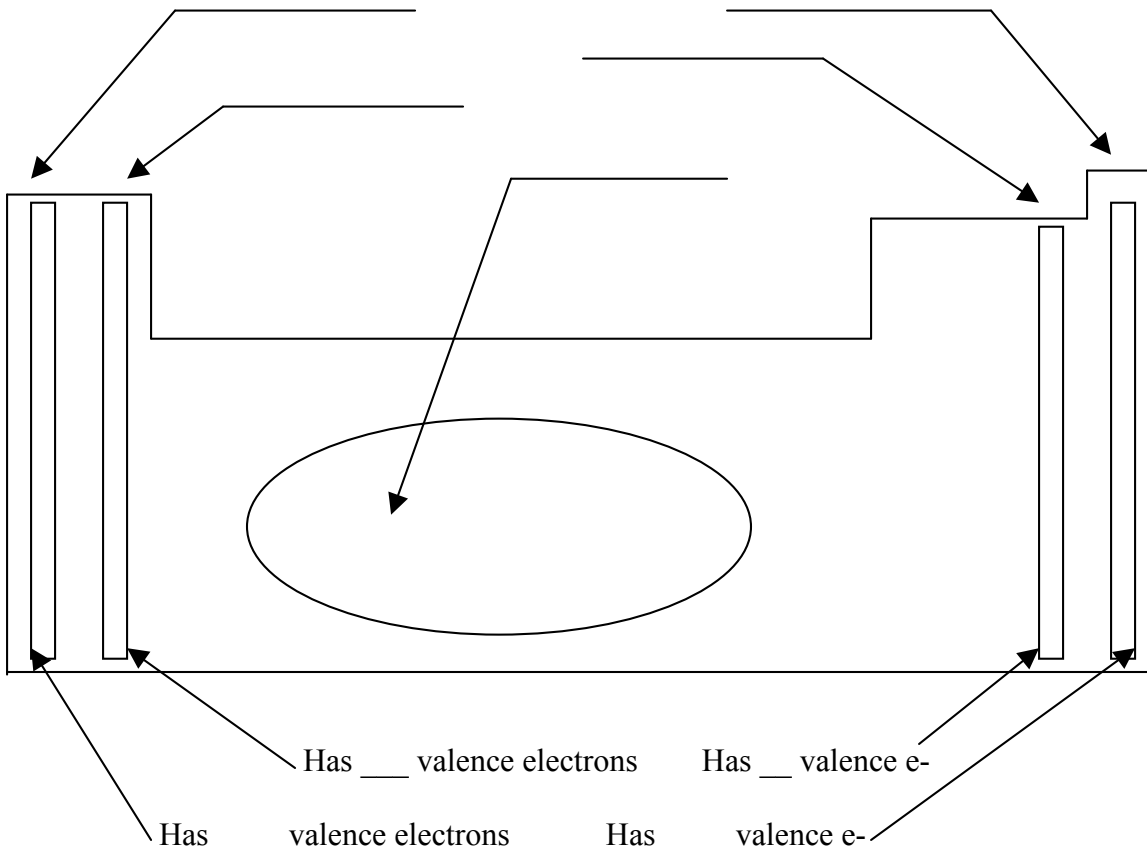


P= _____
E= _____
N= _____
Name of Atom: _____
Atomic #: _____
Atomic Mass: _____
Overall Charge of atom: _____
# of valence electrons: _____

23. Color the Metals RED, the non-metals BLUE, and the metalloids GREEN!

hydrogen 1 H 1.0079												helium 2 He 4.0026					
lithium 3 Li 6.941	beryllium 4 Be 9.0122	<div style="border: 1px solid black; padding: 5px; display: inline-block;">                     Key:                      element name                      atomic number                      symbol                      atomic weight (mean relative mass)                 </div>										boron 5 B 10.811	carbon 6 C 12.011	nitrogen 7 N 14.007	oxygen 8 O 15.999	fluorine 9 F 18.998	neon 10 Ne 20.180
sodium 11 Na 22.990	magnesium 12 Mg 24.305											aluminum 13 Al 26.982	silicon 14 Si 28.086	phosphorus 15 P 30.974	sulfur 16 S 32.065	chlorine 17 Cl 35.453	argon 18 Ar 39.948
potassium 19 K 39.098	calcium 20 Ca 40.078	scandium 21 Sc 44.956	titanium 22 Ti 47.867	vanadium 23 V 50.942	chromium 24 Cr 51.996	manganese 25 Mn 54.938	iron 26 Fe 55.845	cobalt 27 Co 58.933	nickel 28 Ni 58.693	copper 29 Cu 63.546	zinc 30 Zn 65.39	gallium 31 Ga 69.723	germanium 32 Ge 72.61	arsenic 33 As 74.922	selenium 34 Se 78.96	bromine 35 Br 79.904	krypton 36 Kr 83.80
rubidium 37 Rb 85.468	strontium 38 Sr 87.62	yttrium 39 Y 88.906	zirconium 40 Zr 91.224	niobium 41 Nb 92.906	molybdenum 42 Mo 95.94	technetium 43 Tc [98]	ruthenium 44 Ru 101.07	rhodium 45 Rh 102.91	palladium 46 Pd 106.42	silver 47 Ag 107.87	cadmium 48 Cd 112.41	indium 49 In 114.82	tin 50 Sn 118.71	antimony 51 Sb 121.76	tellurium 52 Te 127.60	iodine 53 I 126.90	xenon 54 Xe 131.29
caesium 55 Cs 132.91	barium 56 Ba 137.33	lanthanum 57 La 138.91	cerium 58 Ce 140.12	praseodymium 59 Pr 140.91	neodymium 60 Nd 144.24	promethium 61 Pm [145]	samarium 62 Sm 150.36	europium 63 Eu 151.96	gadolinium 64 Gd 157.25	terbium 65 Tb 158.93	dysprosium 66 Dy 162.50	holmium 67 Ho 164.93	erbium 68 Er 167.26	thulium 69 Tm 168.93	ytterbium 70 Yb 173.04		
francium 87 Fr [223]	radium 88 Ra [226]	actinium 89 Ac [227]	thorium 90 Th 232.04	protactinium 91 Pa 231.04	uranium 92 U 238.03	neptunium 93 Np [237]	plutonium 94 Pu [244]	americium 95 Am [243]	curium 96 Cm [247]	berkelium 97 Bk [247]	californium 98 Cf [251]	einsteinium 99 Es [252]	fermium 100 Fm [257]	mendelevium 101 Md [258]	nobelium 102 No [259]		
57-70 *		lutetium 71 Lu 174.97	hafnium 72 Hf 178.49	tantalum 73 Ta 180.95	tungsten 74 W 183.84	rhenium 75 Re 186.21	osmium 76 Os 190.23	iridium 77 Ir 192.22	platinum 78 Pt 195.08	gold 79 Au 196.97	mercury 80 Hg 200.59	thallium 81 Tl 204.38	lead 82 Pb 207.2	bismuth 83 Bi 208.98	polonium 84 Po [209]	astatine 85 At [210]	radon 86 Rn [222]
89-102 **		lawrencium 103 Lr [262]	rutherfordium 104 Rf [261]	dubnium 105 Db [262]	seaborgium 106 Sg [266]	bohrium 107 Bh [264]	hassium 108 Hs [269]	meitnerium 109 Mt [268]	ununnium 110 Uun [271]	ununium 111 Uuu [272]	unubium 112 Uub [277]	ununquadium 114 Uuq [289]					

24. Label the following: **Alkali Metal, Alkali-Earth Metals, Halogens, Noble gases, and transitions metals.**



## The following is a practice test for you.

### True/False

*Indicate whether the sentence or statement is true or false.*

- \_\_\_ 1. Na and K are in the same family so they have similar properties.
- \_\_\_ 2. Na and K have the same number of electrons in their outer shells.
- \_\_\_ 3. The central core of an atom is called the hub.
- \_\_\_ 4. Bohr's model looks like planets going around the sun.
- \_\_\_ 5. The chart showing the classifications of elements according to their properties and increasing atomic numbers is called the periodic table.
- \_\_\_ 6. The mass of an electron is about equal to the mass of a proton.
- \_\_\_ 7. Elements arranged in vertical columns in the periodic table are called periods.
- \_\_\_ 8. The region around the nucleus occupied by the electrons is called the negative zone.
- \_\_\_ 9. The maximum number of electrons in the second energy level of an atom is 4.
- \_\_\_ 10. Two isotopes of carbon are carbon-12 and carbon-14. These isotopes differ from one another by two protons.
- \_\_\_ 11. The sum of the number of protons and neutrons in an atom is the mass number.
- \_\_\_ 12. A very stable electron arrangement in the outer energy level is characteristic of noble gases.
- \_\_\_ 13. One proton and one electron are added to each element as you go across the periodic table.
- \_\_\_ 14. The atomic number of an element is determined by the number of protons in the nucleus.
- \_\_\_ 15. According to present atomic theory, the location of an electron in an atom cannot be pinpointed exactly.
- \_\_\_ 16. Moving from left to right in a row of the periodic table, metallic properties increase.
- \_\_\_ 17. Metals are good conductors of heat and electricity.

*For this element, identify the following information:*

18. Symbol: \_\_\_\_\_
19. Name: \_\_\_\_\_
20. Atomic Number: \_\_\_\_\_
21. Protons: \_\_\_\_\_
22. Atomic Mass: \_\_\_\_\_
23. Electrons: \_\_\_\_\_
24. Electrons in the 1<sup>st</sup> energy level: \_\_\_\_\_
25. Electrons in the 2<sup>nd</sup> energy level: \_\_\_\_\_
26. Electrons in the 3<sup>rd</sup> energy level: \_\_\_\_\_
27. Electrons in the 4<sup>th</sup> energy level: \_\_\_\_\_
28. Electrons in the 5<sup>th</sup> energy level: \_\_\_\_\_
29. Number of valence electrons: \_\_\_\_\_
30. Family/group: \_\_\_\_\_
31. Row/period: \_\_\_\_\_
32. Circle the correct family: Alkali, Alkali-Earth, Noble gas, or transition metal
33. Reactive or non-reactive

<b>19</b>	2
	8
	8
	1
<b>K</b>	
Potassium	
<b>39</b>	