Electron Configurations Worksheet

Write the complete **ground state electron configurations** and **orbital notations** for the following:

	# of e^-	Element (atom)	e^- configuration	Orbital Notations/ diagrams
1)	_____	lithium	_____	_____
2)	_____	oxygen	_____	_____
3)	_____	calcium	_____	_____
4)	_____	nitrogen	_____	_____
5)	_____	potassium	_____	_____
6)	_____	chlorine	_____	_____
7)	_____	hydrogen	_____	_____
8)	_____	copper	_____	_____
9)	_____	neon	_____	_____
10)	_____	phosphorous	_____	_____

Write the abbreviated ground state electron configurations for the following:

	# of electrons	Element
11)	_____	helium _____
12)	_____	nitrogen _____
13)	_____	chlorine _____
14)	_____	iron _____
15)	_____	zinc _____
16)	_____	barium _____
17)	_____	bromine _____
18)	_____	magnesium _____
19)	_____	fluorine _____
20)	_____	aluminum _____

Electron Configuration Elements (atoms) and Ions

Write the **electron configuration** and **orbital notations** for the following Atoms and ions:

Element / Ions	Atomic number	# of e^-	Electron Configuration
F			
F^{1-}			
O			
O^{-2}			
Na			
Na^{1+}			
Ca			
Ca^{+2}			

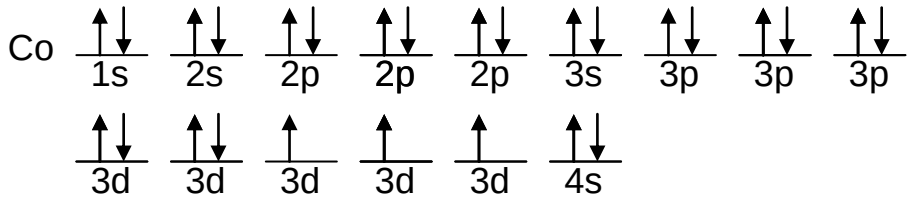
Al^{3+}			
Al			
N			
N^{3-}			
S^{2-}			
Cl^{1-}			
K^{1+}			
S			
Br^{1-}			
Mg^{2+}			

Electron Configuration Practice

Directions: Write and draw the electron configurations of each of the following atoms.

Example:

Co : 27 e^- $1s^2$ $2s^2$ $2p^6$ $3s^2$ $3p^6$ $4s^2$ $3d^7$



1. Scandium:

2. Gallium:

3. Silver:

4. Argon:

5. Nitrogen:

6. Lithium:

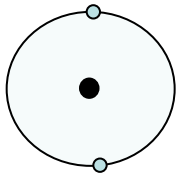
7. Sulfur:

Name:_____ Date:_____ Period:_____

Electron Position and Configuration
Chemistry 513/543

Position: Draw the Electron Position of each of the following atoms.

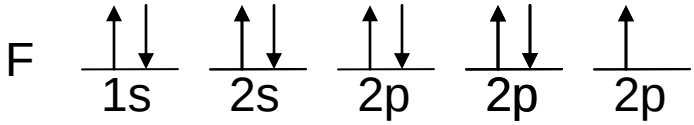
Example:

He: 

1. Li
2. C
3. O
4. Ar

Directions: Draw the electron configurations of each of the following atoms.

Example:



1. Chlorine:
2. Nitrogen:
3. Aluminum:
4. Oxygen:
5. Sodium:
6. Potassium:
7. Sulfur:
8. Calcium

Name:_____ Date_____ Per:_____

Electron Configuration Practice - Homework

*In the space below, write the **expanded electron configurations (ex. = $1s^2 2s^1$)** of the following elements:*

1) Sodium _____

2) potassium _____

3) chlorine _____

4) bromine _____

5) oxygen _____

*In the space below, write the **abbreviated electron configurations (ex. Li= [He]$2s^1$)** of the following elements:*

6) manganese _____

7) silver _____

8) nitrogen _____

9) sulfur _____

10) argon _____

*In the space below, write the **orbital notation** (arrows) of the following elements:*

11) manganese _____

12) silver _____

13) nitrogen _____

14) sulfur _____

15) argon _____

Determine what elements are denoted by the following electron configurations:

16) $1s^2 2s^2 2p^6 3s^2 3p^4$ _____

17) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^1$ _____

18) [Kr] $5s^2 4d^{10} 5p^3$ _____

19) [Xe] $6s^2 4f^{14} 5d^6$ _____

20) [Rn] $7s^2 5f^{11}$ _____

Determine which of the following electron configurations are not valid:

21) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 4d^{10} 4p^5$ _____ 22) $1s^2 2s^2 2p^6 3s^3 3d^5$ _____

23) [Ra] $7s^2 5f^8$ _____ 24) [Kr] $5s^2 4d^{10} 5p^5$ _____

25) [Xe] _____

Name:_____ Date_____ Per:_____

Electrons, Valence, and Lewis Dot Structures
Chem 544/545 Dr. Brielmann

Name_____

Period_____

1. How many electrons are present in:

Helium (He)_____Carbon (C)_____ Neon (Ne)_____ Sodium (Na)_____ Zinc (Zn)____

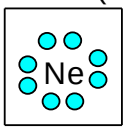
2. How many **valence** electrons are present in:

Helium (He)_____Carbon (C)_____ Neon (Ne)_____ Sodium (Na)_____

Potassium (K)_____ Fluorine (F)_____ Chlorine _____ Bromine_____

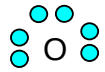
3. Draw Lewis Dot Structures for the following elements:

Helium (He) Carbon (C) Neon (Ne) Sodium (Na)



4. Correct the following Lewis Dot Structures:

Oxygen Nitrogen Beryllium Fluorine



5. Fill in the following table:

	Carbon	Carbon anion C^-	Carbon cation C^+
number of electrons:			
number of valence electrons			
Lewis structure			

Name:_____ Date_____ Per:_____

Law of Conservation of Matter and Electron Configuration Review

1. a. Define the term valence shell.

   b. Why is the valence shell so important in studying chemical reactions?

2. Given an element with atomic number 11, provide the following information:

   a. How many electrons will fill each of the following shells:
      1^{st} shell:
      2^{nd} shell:
      3^{rd} shell:

   b. Is this element likely to form a cation or anion?
   c. What charge will the ion formed by this element have?

3. Roman numerals are needed when naming many of the transition metals because

   _____

   _____

4. a. A molecule with an overall positive or negative charge is called a _____.
   b. An example of one is _____

5. Explain, based on electron configuration, why the noble gases are so unreactive. Use helium and neon as examples to illustrate your explanation.

6. Each of the following chemical formulas and names are written incorrectly. Rewrite them correctly.

   a. Cl_2Mg
   b. NaP
   c. Iron Sulfur
   d. NH_4Cl_3
   e. Cesium (I) bromide

7. a. What does the Law of Conservation of Matter state?

   _____

   _____

   b. Explain the reason for balancing equations based on this law.