

Name: _____

Period: _____

Seat#: _____

An atom has the tendency to lose electrons (to another atom) or to gain electrons (from another atom) in order to make the outer shell (valence shell) complete with eight electrons. This is called a “full valence shell.” Not all orbitals are full with 8, but 8 is the common number to be considered full. Atoms with a complete outer shell are considered stable. Some atoms naturally have eight electrons in their outer shell and are very stable – these are the “Noble Gases” and they are typically unreactive or “inert.” He, Ne, Ar, Kr, Xe and Rn are these very stable Noble Gases. (Helium is an exception to the “8 is great” stability rule because it is stable with only two electrons in its outer shell.) **Complete the following chart:**

Element	Atomic number	Electron Configuration	Number electrons in each energy level	Number e ⁻ probably lost or gained	# e- left after loss or gain	Charge on ion
O	8	1s ² 2s ² 2p ⁴	2, 6	Gain 2	10	-2
Na	11	1s ² 2s ² 2p ⁶ 3s ¹	2, 8, 1	Lose 1	10	+1
S						
K						
Al						
Cl						
Xe						
Ca						
F						
Br						
N						
Ar						
I						
Sr						

Dougherty Valley HS Chemistry

Electron Configuration – Ions

Write the ground state electron configurations for the following ions.

Remember that ions have a change in their total number of electrons. Positive ions have lost electrons, and negative ions have gained electrons. Use the chart you just made on the front to help you do this faster (you figured out the ion charge on the front and the starting configuration already!)

Element	Ion Symbol	Electron Configuration for the ION	Number electrons in The VALENCE SHELL now that it is an ion
O	O ²⁻	1s ² 2s ² 2p ⁶	8
Na	Na ⁺	1s ² 2s ² 2p ⁶	8
S			
K			
Al			
Cl			
Xe	NA	NA	NA
Ca			
F			
Br			
N			
Ar	NA	NA	NA
I			
Sr			

Dougherty Valley HS Chemistry
Electron Configuration – Ions

Write the ground state electron configuration for the following ions:

1) O^+	
2) C^-	
3) F^+	
4) Ar^+	
5) Look at the configurations that you wrote in Q#1 – are those ions that those atoms would <i>want</i> to make? Why or why not?	

Write the NOBLE GAS configuration for the following ions:

6) Cl^-	
7) P^{3-}	
8) Br^-	
9) Se^{2-}	
10) Na^+	
11) Ba^{2+}	
12) Fe^{3+}	
13) Ag^+	
14) Ni^{2+}	
15) Cr^{3+}	

Determine the number of unpaired electrons in the ground state of the following ions.

You can use an orbital diagram to help you, but you can also just use the periodic table!

16) F^+	20) Describe why atoms like to make certain ions. Also describe the pattern on the periodic table that lets us find the preferred ion quickly!
17) Sn^{2+}	
18) Bi^{3+}	
19) Ar^+	