**Review Package #3**

1. Complete the following table.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Symbol** | **Atomic Mass** | **Atomic Number** | **Number of Protons** | **Number of Neutrons** | **Number of Electrons** |
|  | 52 | 24 |  |  | 24 |
| (neutral) |  |  | 15 | 17 |  |
|  | 127 | 52 |  |  | 54 |
|  |  | 26 |  | 30 | 23 |
| Ca |  |  |  | 21 |  |
| Hg2+ | 201 |  |  |  |  |
|  |  |  | 36 | 47 | 36 |
| Br- |  |  |  | 43 | 36 |
| Ga+3 | 70 |  |  |  | 28 |
| N3- |  | 7 |  | 7 |  |

1. Complete the following table:

|  |  |  |  |
| --- | --- | --- | --- |
| ***Isotope*** | ***Protons*** | ***Neutrons*** | ***Electrons*** |
| 194Ir3+ |  |  |  |
| 202Hg2+ |  |  |  |
| 125Te 2- |  |  |  |
| 263Sg |  |  |  |
| 2H+ |  |  |  |

1. Element “X” is composed of the following naturally occurring isotopes:

|  |  |
| --- | --- |
| Isotope | % Abundance |
| 79X | 50.69 |
| 81X | 49.31 |

 Calculate the average atomic mass of element “X” to 3 decimal places.

 Element “X” is actually the real element \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. In order to become stable,

 an atom of Sr will \_\_\_\_\_\_\_\_\_\_ \_\_\_ electrons and become the ion \_\_\_\_\_\_\_\_

an atom of As will \_\_\_\_\_\_\_\_\_\_ \_\_\_ electrons and become the ion \_\_\_\_\_\_\_\_

 an atom of Al will \_\_\_\_\_\_\_\_\_\_ \_\_\_ electrons and become the ion \_\_\_\_\_\_\_\_

 an atom of Se will \_\_\_\_\_\_\_\_\_\_ \_\_\_ electrons and become the ion \_\_\_\_\_\_\_\_

 an atom of N will \_\_\_\_\_\_\_\_\_\_ \_\_\_ electrons and become the ion \_\_\_\_\_\_\_\_

 an atom of I will \_\_\_\_\_\_\_\_\_\_ \_\_\_ electrons and become the ion \_\_\_\_\_\_\_\_

 an atom of Cs will \_\_\_\_\_\_\_\_\_\_ \_\_\_ electrons and become the ion \_\_\_\_\_\_\_\_

 an atom of Te will \_\_\_\_\_\_\_\_\_\_ \_\_\_ electrons and become the ion \_\_\_\_\_\_\_\_

1. Write the core-notation electron configuration for the elements listed below.
	1. Be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. C \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. N \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	4. Na \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	5. S \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	6. Ar \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	7. V \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	8. Cu \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	9. Ge \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	10. Br \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Complete the following table.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Symbol** | **Number of Protons** | **Number of Neutrons** | **Number of Electrons** | **Core Electron Configurations** |
|   |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

1. In the table below briefly summarize the MAJOR contribution(s) the scientist made to our understanding of the atom.

|  |  |
| --- | --- |
| **Scientist** | **Major Contributions(s)** |
| Dalton |  |
| Bohr |  |
| Thompson |  |
| Chadwick |  |
| Rutherford |  |

**Elements and the periodic Table:**

1. What is a period of the periodic table?
2. What is a group or family of the periodic table?
3. Complete the following table:

|  |  |  |  |
| --- | --- | --- | --- |
| **Family Members** | **Family Name** | **Number of Valence Electrons** | **Charge on the ions usually formed** |
| Li, Na, K, Rb, Cs, Fr |  |  |  |
| B, Al, Ga, In, Tl |  |  |  |
| F, Cl, Br, I, At |  |  |  |
| Be, Mg, Ca, Sr, Ba, Ra |  |  |  |
| N, P, As, Sb, Bi |  |  |  |
| He, Ne, Ar, Kr, Xe, Rn |  |  |  |
| O, S, Se, Te, Po |  |  |  |

1. Define the following Terms:
	1. Atomic Radius:
	2. Ionization Energy:
	3. Electronegativity:
2. Correctly fill in the blanks below with either “increases” or decreases
	1. As you move from left to right across the periodic table:

 Atomic Radius: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Ionization Energy: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Electronegativity: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. As you move down the periodic table:

 Atomic Radius: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Ionization Energy: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Electronegativity: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Which of the following has the LARGEST atomic radius?
	* 1. Li, Na, K, Rb \_\_\_\_\_\_\_\_\_
		2. Na, Mg, Al, Si \_\_\_\_\_\_\_\_\_
		3. Mg, Os, Cl \_\_\_\_\_\_\_\_\_
		4. Na+, Mg2+, Al3+, \_\_\_\_\_\_\_\_\_
		5. P3-, S2-, Cl- \_\_\_\_\_\_\_\_\_
		6. N, O, F, Cl \_\_\_\_\_\_\_\_\_
2. Which of the following has the LARGEST ionization energy?
	* 1. Li, Na, K, Rb \_\_\_\_\_\_\_\_\_
		2. Na, Mg, Al, Si \_\_\_\_\_\_\_\_\_
		3. Mg, Os, Cl \_\_\_\_\_\_\_\_\_
		4. Na+, Mg2+, Al3+, \_\_\_\_\_\_\_\_\_
		5. P3-, S2-, Cl- \_\_\_\_\_\_\_\_\_
		6. N, O, F, Cl \_\_\_\_\_\_\_\_\_
3. Which of the following has the SMALLEST electronegativity value?
	* 1. Li, Na, K, Rb \_\_\_\_\_\_\_\_\_
		2. Na, Mg, Al, Si \_\_\_\_\_\_\_\_\_
		3. Mg, Os, Cl \_\_\_\_\_\_\_\_\_
		4. Na+, Mg2+, Al3+, \_\_\_\_\_\_\_\_\_
		5. P3-, S2-, Cl- \_\_\_\_\_\_\_\_\_
		6. N, O, F, Cl \_\_\_\_\_\_\_\_\_

Chemical Bonding:

1. Define valence electrons:
2. Describe what is happening to the electrons involved in a:
	1. Covalent Bond:
	2. Polar Covalent Bond:
	3. Ionic Bond:
3. Draw the Lewis Structures for each of the following
	1. Al
	2. Ca
	3. F-
	4. S2-
	5. CH3OH
	6. BF3
	7. SO3
	8. H2O
	9. C2H2
	10. CO32-
	11. N2

5. In an ionic bond, electrons are

* 1. shared equally by two atoms
	2. shared unequally by two atoms
	3. transferred from a metal to a non-metal
	4. transferred from a non-metal to a metal
	5. closer to one end of a molecule, forming a temporary dipole Answer \_\_\_\_\_\_\_\_

6. In a covalent bond, electrons are

* 1. shared equally by two atoms
	2. shared unequally by two atoms
	3. transferred from a metal to a non-metal
	4. transferred from a non-metal to a metal
	5. closer to one end of a molecule, forming a temporary dipole Answer \_\_\_\_\_\_\_\_

7. In a polar covalent bond, electrons are

* 1. shared equally by two atoms
	2. shared unequally by two atoms
	3. transferred from a metal to a non-metal
	4. transferred from a non-metal to a metal
	5. closer to one end of a molecule, forming a temporary dipole Answer \_\_\_\_\_\_\_\_

8. In London forces, electrons are

* 1. shared equally by two atoms
	2. shared unequally by two atoms
	3. transferred from a metal to a non-metal
	4. transferred from a non-metal to a metal
	5. closer to one end of a molecule, forming a temporary dipole Answer \_\_\_\_\_\_\_\_