Name_____

Cycle 5: The Periodic Table – Study Guide

Part 1: Periodic Properties – describe and locate each of the following.

Main group elements:

Halogens:

Alkali Metals:

Alkaline Earth Metals:

Transition Metals:

Lanthanides:

Actinides:

Noble Gases:

Part 2: Periodic Table – Fill in the blanks

The _____states that when elements are arranged in order of atomic number, their chemical and physical properties tend to _____. A _____ is a horizontal row of elements, while a _____ is a vertical column. Element properties tend to repeat every period so that elements in a group tend to have similar chemical and physical properties. For example, the _____ _____ are all soft, tarnish in air, react violently with water, form oxides with the formula M_2O, and chlorides with the formula MCl which are ionic compounds that dissolve in water. Elements in a group tend to have the same number of _____, while elements in a period have the same number of electron _ _____.

The entire periodic table and be grouped into 3 rough categories of materials. _____ comprise the majority of the elements of the periodic table, are good conductors of heat and electricity, and react with acids to form salts. While some may be brittle, like manganese, many tend to be shiny, ductile, malleable. An good example would be _____ or _____. An _____ is a mixture of two or more and can be used to eliminate some of the disadvantages of the pure elements; such as how brass is harder than copper and more resistant to corrosion. A _____ is an element that does not conduct electricity and can often react with metals to form salts. An example would be _____ or _____. All but one of these is located on the right hand side of the table. A _____ is the third category and falls in between the other two with some properties of each. An example would be _ _____ or _____.

In 1865, _____created the first periodic table by arranging the known elements according to their properties and in order of increasing _____. He noticed that all the elements in a row had similar properties and called this pattern the _____. In 1869, _____ _____ produced the first orderly arrangement of all 63 elements known at the time. He also arranged the elements by _____ and made columns based on chemical and physical properties, but he left _____for unknown elements. Around 1913, _____ ____ used X-ray spectroscopy to measure atomic numbers for the first time and refined the periodic table.

Alkali metals, repeat, hydrogen, alloy, calcium, Law of Octaves, group, gaps, energy levels, gold, atomic mass, Dmitri Mendeleev, antimony, John Newlands, Henry Moseley, metalloid, Periodic Law, period, atomic mass, valence electrons, metals, fluorine, nonmetal, silicon

Part 3: Electron Configurations

Label the periodic table above with the letters of each element block – s, p, d, and f.

Write the full electron configuration for each of the following.

1. Lithium _____

2. Sulfur _____

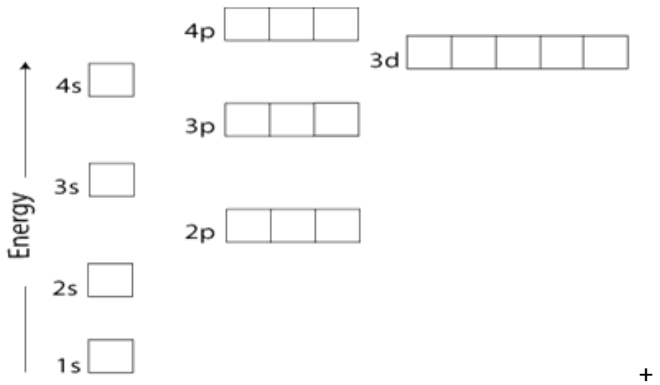
3. Strontium _____

Write abbreviated configurations for each of the following.

1. Argon _____

2. Lead _____

Fill in the electrons in the picture below for Cobalt, following the Aufbau principle.



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A new element Q is discovered in a deep ocean trench. It is a clear, colorless gas under ordinary temperatures and pressures. It is unreactive with water, and does not form compounds directly with oxygen or any other known element. Which group of the Periodic Table would you assign this element to? Please cite one chemical and one physical property you used to determine this.

Mark the trends for atomic size, ionization energy, and electron affinity across periods and down groups: