

## The Periodic Table

A Russian chemist, \_\_\_\_\_, was the first scientist to publish a table similar to the periodic table of today. In the modern periodic table the horizontal rows represent \_\_\_\_\_ of elements and the vertical columns are grouped into \_\_\_\_\_ of elements.

The reactive metals such as potassium and sodium are found in the \_\_\_\_\_ family. These elements are grouped together because they have (a number) \_\_\_\_\_ electron(s) in the outer shell and they tend to (gain or lose) \_\_\_\_\_ this (these) in a chemical reaction.

The next group, Group IIA, is called the \_\_\_\_\_ family. This group is (more or less) \_\_\_\_\_ reactive than the previous group because it has (a number) \_\_\_\_\_ electron(s) in the outer shell and the atomic radius (increased or decreases) \_\_\_\_\_ as the atomic number increases within a period.

Another group of elements, which has 7 electrons in the outer shell, is called the \_\_\_\_\_ family. Within this group, the chemical reactivity (increases or decreases) \_\_\_\_\_ as the atomic number increases.

The least reactive group has either (a number) \_\_\_\_\_ or \_\_\_\_\_ electrons in its outer shell. Because this group does not usually take part in a chemical reaction, it is referred to as the \_\_\_\_\_ gases.

The middle elements in the periodic table, between groups II and III, are responsible for the extra length of the long periods and are called the \_\_\_\_\_ metals. The extra length of this period is a result of the (a letter) \_\_\_\_\_ orbital filling in the third, fourth, and fifth shells. The very long periods of periods, 6 and 7 are a result of the (a letter) \_\_\_\_\_ orbital. The elements of periods 6 and 7 are called the \_\_\_\_\_ and \_\_\_\_\_

\_\_\_\_\_ respectively.

The zigzag line, which begins between boron and aluminum, separates the \_\_\_\_\_ to the right and the \_\_\_\_\_ to the left. Elements near this zigzag line are called \_\_\_\_\_ because they exhibit properties of both groups.

Chemical families have been distinguished by their outer electrons or \_\_\_\_\_ electrons.

there are (a number) \_\_\_\_\_ 'outer electrons'. In determining the 'outer' electrons we are concerned with orbitals having the highest \_\_\_\_\_ Since these 'outer' electrons are so important they can be represented by a special symbol called the \_\_\_\_\_ symbol.

Within the periodic table itself, there are certain trends from left to right and ~~top to~~ bottom.

The minimum voltage required to remove one electron from the atom or the \_\_\_\_\_ (increases or decreases) \_\_\_\_\_ as one moves from left to right within a period and (increases or decreases) \_\_\_\_\_ as one moves from top to the bottom within the family. The variation in the energy required to remove electrons is a direct result of the attraction the electron has for the nucleus or what may be called the atom's \_\_\_\_\_ This attraction tends to (increase or decrease) \_\_\_\_\_ with increasing atomic number within a period and tends to (increase or decrease) \_\_\_\_\_ with increasing atomic number within a family.

The periodic table hence has proven to be effective way to organize the elements according to their \_\_\_\_\_ or \_\_\_\_\_ properties.

# Periodic Trends - Try These

Trends – Try These

## Highest Ionization Energy

F            Cl            I            At

Ionization Energy:

## Lowest Electron Affinity

K            Fe            Zn            Br

Electron Affinity:

## Highest Reactivity

Rb            Sr            Ag            Sn

## Lowest Reactivity

Al            S            Cl            Ar

Atomic Radius:

## Lowest Ionization Energy

Li            Be            B            O

## Largest Atomic Radius

K            Cr            Fe            Cu

## Smallest Atomic Size

F            Cl            Br            I

																		D
																		B
												Z						
	Y																	X
	A																	

1. Draw Lewis diagrams for the following:

Element A

Element B

Element Z

Element X

2. Name two elements that are in the same period. \_\_\_\_\_

Name two elements that are in the same group. \_\_\_\_\_

3. Which of the six labelled elements is the most metallic? \_\_\_\_\_

4. Which of the labelled elements is a metalloid? \_\_\_\_\_

5. Which of the labelled elements is a noble gas? \_\_\_\_\_

6. How does the Ionization Energy vary across a period and why?

7. How does the Ionization Energy vary down a group and why?

8. Compare the ionization energies of Y and X. \_\_\_\_\_

Compare the ionization energies of Y and A. \_\_\_\_\_

9. How does atomic radius vary across a period and why?

10. Compare the atomic radii of Y and X. \_\_\_\_\_

Compare the atomic radii of Y and A. \_\_\_\_\_

11. The Periodic Table is organized on the basis of the atoms' increasing \_\_\_\_\_.