

More Periodic Table Trends

Name: _____

Draw the trend for **ATOMIC RADIUS**

1. Rank each of the following in order of **INCREASING** atomic radius
a.) F, K, Br F, Br, K b.) Os, Ni, Fe Ni, Fe, Os
2. Rank each of the following in order of **DECREASING** atomic radius
a.) Cl, Br, Ga Ga, Br, Cl b.) Ca, Rb, C Rb, Ca, C

Draw the trend for **IONIZATION ENERGY**

- 3.) Rank each of the following in order of **INCREASING** ionization energy
a.) O, S, Ge Ge, S, O b.) Be, Ba, B Ba, Be, B
- 4.) Rank each of the following in order of **DECREASING** ionization energy
a.) Cl, Cu, Au Cl, Cu, Au b.) Te, Sb, Xe Xe, Te, Sb

Draw the trend for **ELECTRONEGATIVITY**

- 5.) Rank each of the following in order of **INCREASING** electronegativity
a.) Na, K, Ne K, Na, Ne b.) Fr, Ca, Co Fr, Ca, Co
- 6.) Rank each of the following in order of **DECREASING** electronegativity
a.) As, Se, Sn Se, As, Sn b.) Xe, Ru, Hf Xe, Ru, Hf

7. An atom has a negative electron affinity. Circle all of the statements that might apply to this atom.

- a.) It may be a noble gas.
- b.) It becomes less stable when electron is added.
- c.) It becomes more stable when electron is added. ←
- d.) It is probably a metal.
- e.) It is probably a non-metal. ←
- f.) There is a release of energy when electron is added. ←
- g.) Energy is absorbed when electron is added.

8.) The table below gives the ionization energies for potassium, bromine, and calcium. Identify which element is which from the data given. Explain your answer in the space provided.

ELEMENT 1		ELEMENT 2		ELEMENT 3	
Ionization energy number	Enthalpy ($\frac{kJ}{mol}$)	Ionization energy number	Enthalpy ($\frac{kJ}{mol}$)	Ionization energy number	Enthalpy ($\frac{kJ}{mol}$)
1 st	418.8	1 st	1139.9	1 st	589.8
2 nd	3052	2 nd	2103	2 nd	1145.4
3 rd	4420	3 rd	3470	3 rd	4912.4
4 th	5877	4 th	4560	4 th	6491

ELEMENT 1 is K. ELEMENT 2 is Br. ELEMENT 3 is Ca.

Explanation:

Answer - Bromine has the highest ionization energy for the first electron removal as it is the smallest atom so it holds on tighter and thus takes the most energy to remove. Therefore, it is element 2.

Potassium is the element 1 as for it to lose a second electron would be very high energy as after losing the first electron it has become isoelectronic to a noble gas and thus is very stable.

Place in order from smallest to largest atomic/ion radius:

Fe Fe⁺² Fe⁺¹ Fe⁺² Fe⁺¹ Fe

Place in order from smallest to largest atomic/ion radius:

O O⁻² O⁻¹ O O⁻¹ O⁻²

Place in order from smallest to largest atomic/ion radius:

Na Na⁺¹ Cl Cl Na⁺¹ Na

9.) Put in order of increasing size (smallest to largest): K Cl⁻¹ Ar S⁻² Ar, Cl⁻¹, S⁻², K

a.) Write the abbreviated electron configuration for each ion or atom:

Answer - K - [Ar]4s¹ Cl⁻¹ - [Ne]3s²3p⁶ Ar - [Ne]3s²3p⁶ S⁻² - [Ne]3s²3p⁶

b.) Group elements Answer - Ar, Cl⁻¹, S⁻² are all isoelectronic