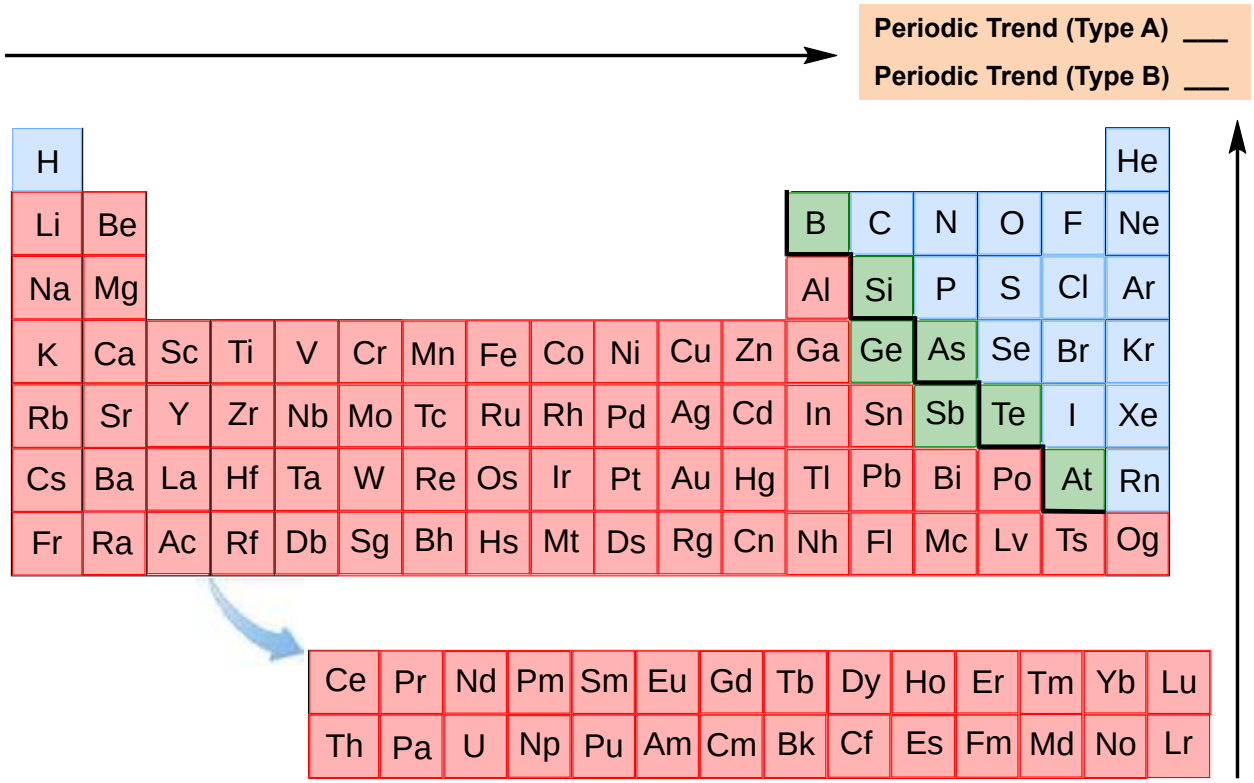
CONCEPT: PERIODIC TREND: CUMULATIVE

- As we move to the top right corner of the Periodic Table, similar periodic trends can be grouped together.
  - □ **Periodic Trends Type A**: Metallic Character and Atomic Radius both _____.
  - □ **Periodic Trends Type B**: The periodic trends starting with **I** or **E** all _____.
    - They include **I**onization Energy, **E**lectron Affinity, **E**lectronegativity, and **E**ffective Nuclear Charge.
  - □ Since Ionic Radius depends on the number of electrons it doesn't belong to either group.



EXAMPLE: Elements with ____ first ionization energies and more _____ electron affinities generally form cations.

a) low, exothermic b) high, endothermic c) low, endothermic d) high, exothermic

PRACTICE: Which of the following statements is false?

a) The first ionization energy of chlorine is larger than magnesium.

b) Anions are larger than their parent atoms.

c) The removal of the first electron from boron is highly exothermic.

d) The oxygen atom is smaller than the barium atom.

e) All of the statements are true.

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PRACTICE: For main-group elements, the atomic radius increases going down a group because:

a) Effective nuclear charge decreases.

b) The mass of an element increases.

c) The highest principal quantum number of the valence orbitals increases.

d) Electron affinity increases.

e) Both effective nuclear charge and the principal quantum number of valence orbitals increases.

PRACTICE: Which of the following statements is false?

a) The electron affinity of phosphorus is less exothermic than those of both silicon and sulfur.

b) The second ionization energy of oxygen is less than the first ionization of fluorine.

c) As the principal quantum number of an atom increases the effective nuclear charge will increase.

d) Cations are smaller than their parent atoms.

e) The second electron affinity of an atom will be more exothermic than the first electron affinity.

PRACTICE: Which of the following statements is true?

a) Valence electrons are more difficult to remove than inner core electrons.

b) Argon and bromide are isoelectronic species.

c) Francium possesses the greatest electronegativity.

d) The second ionization energy of an atom is always larger than its first ionization energy.

e) The aluminum atom will experience a larger jump in its third ionization energy than its fourth.