

- In which of the following elements is the *least* amount of energy required to remove the most loosely bound electron from an atom in the gaseous state?  
A) Sr    B) Ar    C) Al    D) Cl
- As the elements Li to F in Period 2 of the Periodic Table are considered in succession, how do the relative electronegativity and the covalent radius of each successive element compare?  
A) The relative electronegativity decreases, and the atomic radius decreases.  
B) The relative electronegativity decreases, and the atomic radius increases.  
C) The relative electronegativity increases, and the atomic radius decreases.  
D) The relative electronegativity increases, and the atomic radius increases.
- The Group 17 element with the highest electronegativity is  
A) fluorine                      B) chlorine  
C) bromine                        D) iodine
- Which characteristics both generally *decrease* when the elements in Period 3 on the Periodic Table are considered in order from left to right?  
A) nonmetallic properties and atomic radius  
B) nonmetallic properties and ionization energy  
C) metallic properties and atomic radius  
D) metallic properties and ionization energy
- Which term represents the attraction one atom has for the electrons in a bond with another atom?  
A) electronegativity  
B) electrical conductivity  
C) first ionization energy  
D) mechanical energy
- Sodium atoms, potassium atoms, and cesium atoms have the same  
A) atomic radius  
B) first ionization energy  
C) total number of protons  
D) oxidation state
- Which element in Period 3 has the greatest tendency to gain electrons?  
A) Na    B) Si    C) Cl    D) Ar
- The reactivity of the metals in Groups 1 and 2 generally increases with  
A) increased ionization energy  
B) increased atomic radius  
C) decreased nuclear charge  
D) decreased mass
- As the elements in Period 3 are considered from left to right, they tend to  
A) lose electrons more readily and increase in metallic character  
B) lose electrons more readily and increase in nonmetallic character  
C) gain electrons more readily and increase in metallic character  
D) gain electrons more readily and increase in nonmetallic character
- Which element is considered malleable?  
A) gold                              B) hydrogen  
C) sulfur                             D) radon
- Which general trend is found in Period 2 on the Periodic Table as the elements are considered in order of increasing atomic number?  
A) decreasing atomic mass  
B) decreasing electronegativity  
C) increasing atomic radius  
D) increasing first ionization energy

## Regents Chemistry

12. Which of these elements has physical and chemical properties most similar to silicon (Si)?  
A) germanium (Ge)    B) lead (Pb)  
C) phosphorus (P)    D) chlorine (Cl)
13. Which elements atoms have a larger atomic radius than atoms of silicon?  
A) sodium                      B) carbon  
C) sulfur                        D) chlorine
14. An atom of which element has the greatest attraction for electrons in a chemical bond?  
A) As    B) Ga    C) Ge    D) Se
15. Which group in the Periodic Table contains elements that form ions which are larger than their atoms?  
A) 1    B) 2    C) 13    D) 17
16. When a sodium atom becomes an ion, the size of the atom  
A) decreases by gaining an electron  
B) decreases by losing an electron  
C) increases by gaining an electron  
D) increases by losing an electron
17. As atoms of elements in Group 16 are considered in order from top to bottom, the electronegativity of each successive element  
A) decreases                      B) increases  
C) remains the same
18. Which element in Period 3 has the largest atomic radius?  
A) Cl    B) Al    C) Na    D) P
19. The radius of a calcium ion is smaller than the radius of a calcium atom because the calcium ion contains the same nuclear charge and  
A) fewer protons                  B) more protons  
C) fewer electrons                D) more electrons
20. As the elements of Group 17 are considered in order of increasing atomic number, there is an increase in  
A) atomic radius  
B) electronegativity  
C) first ionization energy  
D) number of electrons in the first shell
21. As the elements in Group 1 of the Periodic Table are considered from top to bottom, each successive element has a  
A) smaller first ionization energy  
B) larger first ionization energy  
C) smaller number of protons  
D) larger number of valence electrons
22. Which compound forms a green aqueous solution?  
A) RbCl                              B) CaCl<sub>2</sub>  
C) NiCl<sub>2</sub>                             D) ZnCl<sub>2</sub>
23. Which element has the highest electrical conductivity?  
A) Mg    B) H    C) He    D) Cl
24. From the list below, which first ionization energy would indicate the most reactive metal?  
A) 500 kJ/mol                      B) 600 kJ/mol  
C) 700 kJ/mol                      D) 800 kJ/mol
25. Which ion has the largest radius?  
A) Na<sup>+</sup>    B) Mg<sup>2+</sup>    C) K<sup>+</sup>    D) Ca<sup>2+</sup>