
Now Let's Try a Few Homework Questions:

- Most nonmetals have the properties of
 - high ionization energy and poor electrical conductivity
 - high ionization energy and good electrical conductivity
 - low ionization energy and poor electrical conductivity
 - low ionization energy and good electrical conductivity
- Which element has the highest first ionization energy?
 - sodium
 - aluminum
 - calcium
 - phosphorus
- Which element in Group 1 has the greatest tendency to lose an electron?
 - cesium
 - rubidium
 - potassium
 - sodium
- Which of the Group 15 elements can lose an electron most readily?
 - N
 - P
 - Sb
 - Bi
- Which first ionization energy is the most probable for a very reactive metal?
 - 380 kJoules/mol
 - 1086 kJoules/mol
 - 1681 kJoules/mol
 - 2372 kJoules/mol
- Which element in Group 1 has the highest tendency to lose an electron?
 - cesium
 - rubidium
 - potassium
 - sodium
- A nonmetal could have an electronegativity of
 - 1.0
 - 2.0
 - 1.6
 - 2.6
- Of all the elements, the one with the highest electronegativity is found in Period
 - 1
 - 2
 - 3
 - 4
- A metal can have an electronegativity of
 - 4.0
 - 1.0
 - 3.5
 - 3.2
- Which electronegativity is possible for a Group 1 metal?
 - 1.0
 - 2.0
 - 3.0
 - 4.0
- According to Reference Table S, which of the following elements has the smallest atomic radius?
 - nickel
 - cobalt
 - calcium
 - potassium
- Which electron configuration represents the atom with the largest covalent radius?
 - 1
 - 2-1
 - 2-2
 - 2-3

13. Which of the following elements has the largest atomic radius?
(1) beryllium (2) magnesium (3) calcium (4) strontium
14. Which element in Period 3 has the largest atomic radius?
(1) Cl (2) Al (3) Na (4) P
15. Which of the following atoms has the largest atomic radius?
(1) Na (2) K (3) Mg (4) Ca
16. An atom of which of the following elements has the *smallest* atomic radius?
(1) Li (2) Be (3) C (4) F
17. 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?
(1) the relative electronegativity decreases, and the covalent radius decreases
(2) the relative electronegativity decreases, and the covalent radius increases
(3) the relative electronegativity increases, and the covalent radius decreases
(4) the relative electronegativity increases, and the covalent radius increases
18. Which element's ionic radius is smaller than its atomic radius?
(1) neon (2) nitrogen (3) sodium (4) sulfur
19. An ion of which element is smaller than its atom?
(1) F (2) O (3) Cl (4) Na
20. An ion of which element is larger than its atom?
(1) Al (2) Br (3) Ca (4) Sr
21. Which atom has a radius larger than the radius of its ion?
(1) Cl (2) Ca (3) S (4) Se
22. When a sodium atom becomes an ion, the size of the atom
(1) decreases by gaining an electron
(2) decreases by losing an electron
(3) increases by gaining an electron
(4) increases by losing an electron

23. When a metal atom combines with a nonmetal atom, the nonmetal atom will
(1) lose electrons and decrease in size
(2) lose electrons and increase in size
(3) gain electrons and decrease in size
(4) gain electrons and increase in size
24. Which group below contains elements with the greatest variation in chemical properties?
(1) Li, Be, B (2) Li, Na, K (3) B, Al, Ga (4) Be, Mg, Ca
25. As the elements in Period 3 are considered from left to right, they tend to
(1) lose electrons more readily and increase in metallic character
(2) lose electrons more readily and increase in nonmetallic character
(3) gain electrons more readily and increase in metallic character
(4) gain electrons more readily and increase in nonmetallic character.
26. 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?
(1) The relative electronegativity decreases and the covalent radius decreases.
(2) The relative electronegativity decreases and the covalent radius increases.
(3) The relative electronegativity increases and the covalent radius decreases.
(4) The relative electronegativity increases and the covalent radius increases.
27. As the elements in Period 2 are considered in sequence from left to right on the Periodic Table, the nuclear charge
(1) increases (2) decreases (3) remains the same

CONSTRUCTED RESPONSE QUESTIONS: Parts B-2 and C of NYS Regents Exam

28. Compare and contrast what happens to electronegativity, ionization energy, and atomic radius as you go down Group 2. Use the Periodic Table and data from Table S to show how you reached your conclusion.
29. Compare and contrast what happens to electronegativity, ionization energy, and atomic radius as you go across period 3. Use the Periodic Table and data from Table S to show how you reached your conclusion.
30. Explain why, in the same period, the ionic radius of nonmetals is larger than the ionic radius of metals.
31. Explain how the properties of elements vary (change) as you go across a period.