

Name _____

Honors Chemistry

//_

SOL Questions – Chapter 3

Choose the best answer for each of the following. Darken in the answer on the blue side of your scantron.

1. Three elements, X, Y, and Z, have consecutive increasing atomic numbers. If element X is a noble gas, what will be the symbol for the ion of element Z in its compounds?

- a. Z^{2-} b. Z^{-} c. Z^{+} d. Z^{2+}

2. The alkali metals are located in which group of the periodic table?

- a. 1 b. 2 c. 3 d. 4

3. Which pairs of elements below would have the most similar atomic structures?

- a. Sodium and scandium b. Sodium and barium c. Sodium and potassium d. Sodium and aluminum

4. Oxygen and sulfur are in the same group in the periodic table. This means that, in general, oxygen and sulfur —

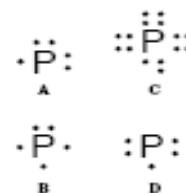
- a. will react only with each other b. undergo similar reactions with other elements
c. can only react with elements in group 16 d. combine only with elements in periods of 4 or higher

5. According to the periodic table, which of the following series of elements is ordered according to decreasing reactivity?

- a. He, Cs, Si, Mg b. Cs, Mg, Si, He
c. Si, He, Cs, Mg d. Mg, Si, Cs, He

6. Which diagram to the right is the Lewis electron dot diagram for phosphorous?

- a. A b. B c. C d. D

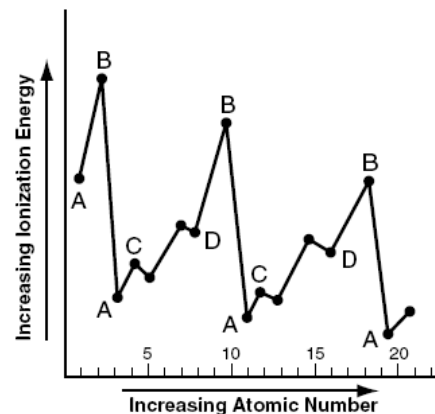


7. From left to right across a period, what change is occurring within the atomic nuclei?

- a. A proton is gained. b. An electron is gained.
c. A neutron is lost. d. The electron cloud size is decreasing.

8. The chart to the right shows the relationship between the first ionization potential and the increase in atomic number. The letter on the chart that indicates the noble gases or the inert elements is —

- a. A b. B c. C d. D



9. The Lewis electron dot system represents electrons in the —

- a. outer energy level b. inner level
c. middle level d. core level

10. The elements that are characterized by having only five electrons in the p sublevel belong to which family of elements?

- a. Transition b. Alkali c. Noble gas d. Halogens

11. Which of these describes a tendency for atomic radii as displayed on the periodic chart?

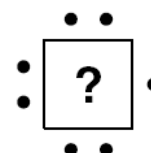
- a. Atomic radii decrease left to right across a period.
b. Atomic radii increase left to right across a period.
c. Atomic radii decrease top to bottom down a group.
d. Atomic radii increase, then decrease from top to bottom down a group.

12. Chlorine forms a $1-$ ion. How many electrons does a chloride ion have?

- a. 1 b. 16 c. 17 d. 18

13. Which of the groups below has the electron dot structure shown to the right?

- a. Noble gases b. Halogens c. Alkali metals d. Transition elements



14. An element has an electron configuration of $1s^2 2s^2 2p^6 3s^2$. Which of these will be in the same group as this element?

- a. $1s^2 2s^2 2p^6$ b. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$ c. $1s^2 2s^2 2p^6 3s^1$ d. $1s^2 2s^2 2p^6 3s^2 3p^6$

15. How many electrons does a calcium ion have?

- a. 2 b. 18 c. 20 d. 22

16. What is the *main* similarity among elements in group 2?

- a. Atomic radius b. Chemical properties c. Mass number d. Boiling point

17. Which of the following properties decreases from left to right across a period?

- a. Atomic number b. Electronegativity c. Atomic radius d. Ionization energy

18. The net charge on an aluminum ion is +3 because there are —

- a. 10 protons and 13 electrons in the atom b. 13 protons and 10 neutrons in the nucleus
c. 10 neutrons and 13 electrons in the atom d. 13 protons and 10 electrons in the atom

19. How many valence electrons does a neutral atom of silicon have?

- a. 3 b. 4 c. 5 d. 6

20. The elements that are characterized by the presence of an incomplete *d* sublevel are called —

- a. transition elements b. alkali earth metals c. halogens d. lanthanoids

21. Atoms of the noble gases are generally inert because —

- a. they are too large to react b. they are not charged
c. they are neutral atoms d. their outer electron levels are filled

22. Which of the elements has the same Lewis structure as sulfur?

- a. Chlorine b. Magnesium c. Oxygen d. Phosphorus

23. A chloride ion has the same number of electrons as a neutral atom of —

- a. fluorine b. sulfur c. argon d. bromine

24. Which of the following is most likely the electronegativity value for chlorine?

- a. 2.3 b. 2.7 c. 3.0 d. 4.2

25. Cations are formed when neutral atoms lose —

- a. electrons b. protons c. neutrons d. positrons

O	F
3.5	4.0
S	Cl
2.5	?
Se	Br
2.4	2.8

26. Which of the elements in the chart to the right is a positive ion with a charge of one?

- a. 1 b. 2 c. 3 d. 4

	Protons	Neutrons	Electrons
1	11	12	10
2	1	0	2
3	15	16	15
4	20	20	18

27. What is the correct Lewis dot structure for arsenic?

- a. $\cdot \ddot{\text{As}} \cdot$ b. $:\ddot{\text{As}}:$ c. $:\ddot{\text{As}}\cdot$ d. $\cdot \ddot{\text{As}} \cdot$

28. Which of these elements contains four valence electrons?

- a. Helium b. Beryllium c. Carbon d. Oxygen

29. Which of these elements has the smallest atomic radius?

- a. Beryllium (Be) b. Oxygen (O) c. Sodium (Na) d. Sulfur (S)

30. Which element is a noble gas?

- a. Fluorine (F) b. Hydrogen (H) c. Nitrogen (N) d. Xenon (Xe)