

Name \_\_\_\_\_

Date \_\_\_\_\_

## Chapter: The Periodic Law

In the space provided, write the letter of the term or phrase that best completes each statement or best answers each question

\_\_\_\_\_ 1. Mendeleev organized the chemical elements based on their

- a. symbols.
- b. properties.
- c. atomic numbers.
- d. charges.

\_\_\_\_\_ 2. A horizontal row in the periodic table is called a(n)

- a. family.
- b. group.
- c. octet.
- d. period.

\_\_\_\_\_ 3. The periodic law states that

- a. no two electrons with the same spin can be found in the same place in an atom.
- b. the physical and chemical properties of the elements are functions of their atomic number.
- c. wave patterns repeat at regular intervals.
- d. the chemical properties of elements can be grouped according to periodicity.

\_\_\_\_\_ 4. An element with the general electron configuration  $ns^2np^1$  for its outermost electrons would be in Group

- a. 2.
- b. 13.
- c. 14.
- d. 15.

\_\_\_\_\_ 5. When a carbon atom is in its ground state, how many electrons does it have in its outermost shell?

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

\_\_\_\_\_ 6. Which of the following elements is most similar in behavior to calcium?

- a. magnesium
- b. sodium
- c. sulfur
- d. chlorine

\_\_\_\_\_ 7. Which periodic group or family of elements is *not* correctly matched with its common family name?

- a. Group 2: alkaline-earth metals
- b. Group 3: alkali metals
- c. Group 17: halogens
- d. Group 18: noble gases

- \_\_\_\_\_ **8.** The electron configurations of main-group elements end in
- d* and *f* orbitals.
  - s* and *p* orbitals.
  - s* and *d* orbitals.
  - p* and *d* orbitals.
- 9.** Which of the following elements is a transition metal?
- calcium
  - iron
  - sodium
  - sulfur
- \_\_\_\_\_ **10.** All the alkali metal elements are found on the periodic table in
- Group 1.
  - Group 2.
  - Period 1.
  - Period 2.
- \_\_\_\_\_ **11.** A measure of the ability of an atom in a chemical compound to attract electrons from another atom in the compound is called
- electron affinity.
  - electron configuration.
  - electronegativity.
  - ionization potential.
- \_\_\_\_\_ **12.** Which of the following elements has the greatest atomic radius?
- Al
  - S
  - Si
  - C
- \_\_\_\_\_ **13.** Which of the following elements has the lowest electronegativity?
- C
  - F
  - Li
  - O
- \_\_\_\_\_ **14.** Which of the following elements has the greatest ionization energy?
- Ga
  - K
  - Bi
  - As
- \_\_\_\_\_ **15.** Which of the following elements has an electron affinity of 0 kJ/m?
- Br
  - As
  - Ar
  - I
- \_\_\_\_\_ **16.** Which of the following elements have full outer energy levels when they are in the ground state?
- alkali metals
  - noble gases
  - halogens
  - transition metals

- \_\_\_\_\_ 17. In which period is an element that has the electron configuration  $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^1$  when it is in its ground state?
- Period 1
  - Period 2
  - Period 3
  - Period 4
- \_\_\_\_\_ 18. Which of the following elements is *not* a metal?
- H
  - K
  - Na
  - Fr
- \_\_\_\_\_ 19. For atoms of *p*-block elements, the total number of electrons in the highest occupied level is equal to the
- period number.
  - group number.
  - period number minus 10.
  - group number minus 10.
- \_\_\_\_\_ 20. As electrons add to *s* and *p* sublevels in the same main energy level, they are pulled closer to the more highly charged nucleus, causing
- the electron cloud around the nucleus to expand.
  - atoms to lose electrons more easily.
  - atomic radii to decrease in size.
  - a noble gas configuration.
- \_\_\_\_\_ 21. Which electron configuration would result in the largest negative electron affinity?
- $[\text{He}]2s^1$
  - $[\text{He}]2s^2 2p^2$
  - $[\text{He}]2s^2 2p^3$
  - $[\text{He}]2s^2 2p^5$
- \_\_\_\_\_ 22. In forming an ion, from which sublevel would an atom of nickel lose electrons first?
- $4s$
  - $3d$
  - $3p$
  - $3s$
- \_\_\_\_\_ 23. Which one of the following groups contains atoms that, in compounds, have the lowest attraction for electrons?
- Group 1
  - Group 2
  - Group 16
  - Group 17
- \_\_\_\_\_ 24. Which ionization energy is generally the largest?
- first ionization energy
  - second ionization energy
  - third ionization energy
  - fourth ionization energy
- \_\_\_\_\_ 25. The metalloids are located on the periodic table between
- halogens and noble gases.
  - nonmetals and metals.
  - alkaline-earth metals and other metals.
  - alkali metals and transition metals.