

14.1

CLASSIFICATION OF THE ELEMENTS

SECTION REVIEW

Objectives

- Explain why you can infer the properties of an element based on those of other elements in the periodic table
- Use electron configurations to classify elements as noble gases, representative elements, transition metals, or inner transition metals

Key Terms

- noble gases
- representative elements
- transition metals
- inner transition metals

Part A Completion

Use this completion exercise to check your understanding of the concepts and terms that are introduced in this section. Each blank can be completed with a term, short phrase, or number.

- The periodic table organizes the elements into vertical _____ 1. _____
 _____ 1 and horizontal _____ 2 in order of increasing _____ 3. _____ 2. _____
- The table is constructed so that elements that have similar chemical _____ 3. _____
 properties are in the same _____ 4. The elements in Groups 1A _____ 4. _____
 through 7A are called the _____ 5. The _____ 6 make up Group 0. _____ 5. _____
- The elements in Groups 2A and 3A are interrupted in periods 4 and _____ 6. _____
 5 by the _____ 7 and in periods 6 and 7 by the _____ 8. _____ 7. _____
- The atoms of the noble gas elements have their outermost _____ 8. _____
 and _____ 9 sublevels filled. The outermost *s* and *p* sublevels of _____ 9. _____
 the representative elements are _____ 10. _____ 10. _____

Part B True-False

Classify each of these statements as always true, AT; sometimes true, ST; or never true, NT.

- _____ 11. The representative elements are the Group A elements.
- _____ 12. Chlorine has the electron configuration $1s^2 2s^2 2p^6 3s^2 3p^7$.
- _____ 13. The element in Group 4A, period 3, is gallium.

_____ 14. There is a relationship between the electron configurations of elements and their chemical and physical properties.

Part C Matching

Match each description in Column B to the correct term in Column A.

Column A	Column B
_____ 15. period	a. an element in which the outermost <i>s</i> and <i>p</i> sublevels are filled
_____ 16. inner transition metal	b. a horizontal row on the periodic table
_____ 17. representative element	c. an element whose outermost <i>s</i> sublevel and nearby <i>d</i> sublevel contain electrons.
_____ 18. transition metal	d. an element whose outermost <i>s</i> and nearby <i>f</i> sublevel generally contain electrons
_____ 19. noble gas	e. a vertical column on the periodic table
_____ 20. group	f. an element whose outermost <i>s</i> or <i>p</i> sublevels are only partially filled.

Part D Questions and Problems

Answer the following in the space provided.

21. List the outer electron configurations for the atoms in period 3 from left to right.

22. List the elements of group 5A. Tell whether each is a solid, liquid or gas, at room temperature; and whether it is a metal, non-metal, or metalloid.
