Section 6.2 Classification of the Elements

In your textbook, read about organizing the elements by electron configuration.

Use the periodic table on pages 156–157 in your textbook to match each element in Column A with the element in Column B that has the most similar chemical properties.

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. arsenic (As)</td>
<td>a. boron (B)</td>
</tr>
<tr>
<td>2. bromine (Br)</td>
<td>b. cesium (Cs)</td>
</tr>
<tr>
<td>3. cadmium (Cd)</td>
<td>c. chromium (Cr)</td>
</tr>
<tr>
<td>4. gallium (Ga)</td>
<td>d. cobalt (Co)</td>
</tr>
<tr>
<td>5. germanium (Ge)</td>
<td>e. hafnium (Hf)</td>
</tr>
<tr>
<td>6. iridium (Ir)</td>
<td>f. iodine (I)</td>
</tr>
<tr>
<td>7. magnesium (Mg)</td>
<td>g. iron (Fe)</td>
</tr>
<tr>
<td>8. neon (Ne)</td>
<td>h. nitrogen (N)</td>
</tr>
<tr>
<td>9. nickel (Ni)</td>
<td>i. platinum (Pt)</td>
</tr>
<tr>
<td>10. osmium (Os)</td>
<td>j. scandium (Sc)</td>
</tr>
<tr>
<td>11. sodium (Na)</td>
<td>k. silicon (Si)</td>
</tr>
<tr>
<td>12. tellurium (Te)</td>
<td>l. strontium (Sr)</td>
</tr>
<tr>
<td>13. tungsten (W)</td>
<td>m. sulfur (S)</td>
</tr>
<tr>
<td>14. yttrium (Y)</td>
<td>n. zinc (Z)</td>
</tr>
<tr>
<td>15. zirconium (Zr)</td>
<td>o. xenon (Xe)</td>
</tr>
</tbody>
</table>

Answer the following questions.

16. Why do sodium and potassium, which belong to the same group in the periodic table, have similar chemical properties?

________________________________________________________________________

________________________________________________________________________

17. How is the energy level of an element’s valence electrons related to its period on the periodic table? Give an example.

________________________________________________________________________

________________________________________________________________________
In your textbook, read about s-, p-, d-, and f-block elements. Use the periodic table on pages 156–157 in your textbook and the periodic table below to answer the following questions.

18. Into how many blocks is the periodic table divided? ____________________________

19. What groups of elements does the s-block contain? ____________________________

20. Why does the s-block portion of the periodic table span two groups? ______________

21. What groups of elements does the p-block contain? ____________________________

22. Why are members of group 8A virtually unreactive? ____________________________

23. How many d-block elements are there? ____________________________

24. What groups of elements does the d-block contain? ____________________________

25. Why does the f-block portion of the periodic table span 14 groups? ______________

26. What is the electron configuration of the element in period 3, group 6A? ______________

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Section 6.3 Periodic Trends

In your textbook, read about atomic radius and ionic radius.

Circle the letter of the choice that best completes the statement or answers the question.

1. Atomic radii cannot be measured directly because the electron cloud surrounding the nucleus does not have a clearly defined
   a. charge.          b. mass.          c. outer edge.          d. probability.

2. Which diagram best represents the group and period trends in atomic radii in the periodic table?
   a. Generally increase
   b. Generally increase
   c. Generally decrease
   d. Generally decrease

3. The general trend in the radius of an atom moving down a group is partially accounted for by the
   a. decrease in the mass of the nucleus.          c. increase in the charge of the nucleus.
   b. fewer number of filled orbitals.          d. shielding of the outer electrons by inner electrons.

4. A(n) _______ is an atom, or bonded group of atoms, that has a positive or negative charge.
   a. halogen          b. ion          c. isotope          d. molecule

5. An atom becomes negatively charged by
   a. gaining an electron. b. gaining a proton. c. losing an electron. d. losing a neutron.

6. Which diagram best represents the relationship between the diameter of a sodium atom and the diameter of a positive sodium ion?
   Na     Na⁺     Na     Na⁺
In your textbook, read about ionization energy and electronegativity.

Answer the following questions.

7. What is ionization energy?

8. Explain why an atom with a high ionization-energy value is not likely to form a positive ion.

9. What is the period trend in the first ionization energies? Why?

10. What is the group trend in the first ionization energies? Why?

11. State the octet rule.

12. What does the electronegativity of an element indicate?

13. What are the period and group trends in electronegativities?