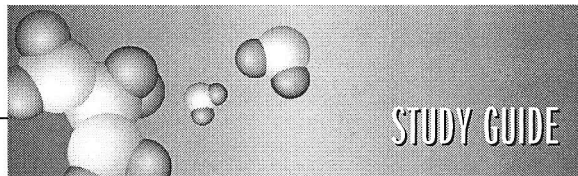


Name \_\_\_\_\_

Date \_\_\_\_\_

Class \_\_\_\_\_



STUDY GUIDE

## 3.1 The Development of the Periodic Table

## CHAPTER 3

Use with text pages 86 - 94

Use each of the terms below just once to complete the following passage.

triads

Döbereiner

atomic mass

noble gases

halogen

atomic numbers

periodicity

rows

Mendeleev

eka-aluminum

One of the earliest efforts to group the chemical elements in some kind of logical sequence was made by the German chemist (1) \_\_\_\_\_ in 1829. This effort was based on the fact that some elements have similar properties and can be placed in groups of three elements, called (2) \_\_\_\_\_. An example of such a group is the (3) \_\_\_\_\_ group, consisting of chlorine, bromine, and iodine. A more sophisticated method for grouping the elements was suggested in 1869 by the Russian chemist (4) \_\_\_\_\_. This method was based on the fact that, when the elements are arranged in order according to their (5) \_\_\_\_\_, their properties appear to repeat on a regular basis, a phenomenon known as (6) \_\_\_\_\_. In the first periodic table, elements with similar properties were placed together in (7) \_\_\_\_\_. Proof that this system of arranging the elements was correct came with the successful prediction of an element that had not yet been discovered, an element given the name of (8) \_\_\_\_\_. That element was actually discovered less than 20 years later. The primary way in which the modern periodic table differs from the original periodic table is that elements are now arranged according to their (9) \_\_\_\_\_. The rows in the modern periodic table begin with metals and end with (10) \_\_\_\_\_.

Circle the letter of the choice that is the best response or that best completes the statement.

11. In 1860, chemists could make which of the following statements about the known chemical elements?
- a. They all had identical properties.                      b. Some had similar properties.  
c. They all had different properties.                      d. They could not be grouped.
12. Early scientists classified \_\_\_\_\_ as one of the coinage metals.
- a. lithium    b. chlorine  
c. copper    d. iron
13. If the first and last elements in a triad have atomic masses of 7 and 39, respectively, then the atomic mass of the middle element is about \_\_\_\_\_.
- a. 23    b. 46  
c. 15.3    d. 32
14. Mendeleev's first periodic table consisted of \_\_\_\_\_ groups.
- a. 3    b. 18  
c. 8    d. 2
15. Which of the following is not a periodic phenomenon?
- a. rising of the sun    b. appearance of Halley's comet  
c. ocean tides    d. growth of a sunflower
16. When moving from left to right across the modern periodic table, the atomic numbers of the elements \_\_\_\_\_.
- a. do not change    b. increase by one  
c. decrease by one    d. are the same as the atomic masses
17. The modern periodic table is made up of \_\_\_\_\_ elements.
- a. 60    b. 111  
c. 92    d. 25
18. In Döbereiner's halogen triad, the density, boiling point, and melting point of the elements \_\_\_\_\_ as atomic mass increases.
- a. stay the same    b. increase  
c. double    d. decrease
19. In the modern periodic table, elements in the same \_\_\_\_\_ have similar properties.
- a. column    b. period  
c. row    d. area
20. Döbereiner and Mendeleev both tried to relate the properties of elements to their \_\_\_\_\_.
- a. number of electrons    b. atomic number  
c. number of protons    d. atomic mass