

QuickLAB

Designing Your Own Periodic Table

Question

Can you design your own periodic table using information similar to that available to Mendeleev?

Procedure

1. Write down the information available for each element on separate index cards. The following information is appropriate: a letter of the alphabet (A, B, C, etc.) to identify each element; atomic mass; state; density; melting point; boiling point; and any other readily observable physical properties. Do not write the name of the element on the index card, but keep a separate list indicating the letters you have assigned to each element.
2. Organize the cards for the elements in a logical pattern as you think Mendeleev might have done.

Discussion

1. Keeping in mind that the information you have is similar to that available to Mendeleev in 1869, answer the following questions.
 - a. Why are atomic masses given instead of atomic numbers?
 - b. Can you identify each element by name?
2. How many groups of elements, or families, are in your periodic table? How many periods, or series, are in the table?
3. Predict the characteristics of any missing elements. When you have finished, check your work using your separate list of elements and a periodic table.

Materials

- index cards



SECTION REVIEW

1.
 - a. Who is credited with developing a method that led to the determination of standard relative atomic masses?
 - b. Who discovered the periodic law?
 - c. Who established atomic numbers as the basis for organizing the periodic table?
2. State the periodic law.
3. Name three sets of elements that have been added to the periodic table after Mendeleev's time.
4. How do the atomic numbers of the elements within each of Groups 1, 2, and 13–18 of the periodic table vary? (Refer to **Figure 4** as a guide.)

Critical Thinking

5. **RELATING IDEAS** Why are elements' atomic masses not in strict increasing order in the periodic table, even though the properties of the elements are similar? For example, by atomic mass, tellurium, Te, should be in group 17 and iodine, I, should be in Group 16, but grouping by properties has Te in Group 16 and I in Group 17.