INQUIRY LAB

The Mendeleev Lab of 1869

OBJECTIVES

- ***Observe*** **the physical properties of common elements.**
- ***Observe*** **the properties and trends in the elements on the periodic table.**
- ***Draw conclusions*** **and** ***identify*** **unknown elements based on observed trends in properties.**

MATERIALS

- **blank periodic table**
- **elemental samples: Ar, C, Sn, and Pb**
- **note cards, 3 in. × 5 in.**
- **periodic table**

BACKGROUND

Russian chemist Dmitri Mendeleev is generally credited with being the first chemist to observe that patterns emerge when the elements are arranged according to their properties. Mendeleev's arrangement of the elements was unique because he left blank spaces for elements that he claimed were undiscovered as of 1869. Mendeleev was so confident that he even predicted the properties of these undiscovered elements. His predictions were eventually proven to be quite accurate, and these new elements fill the spaces that originally were blank in his table. Use your knowledge of the periodic table to determine the identity of each of the nine unknown elements in this activity. These unknown elements are from the periodic table's groups that are listed below. Each of these groups contains at least one unknown element.

1 2 11 13 14 17 18

None of the known elements serves as one of the nine unknown elements. No radioactive elements are used during this experiment. The relevant radioactive elements include Fr, Ra, At, and Rn. You may not use your textbook or other reference materials. You have been provided with enough information to determine each of the unknown elements.

SAFETY

For review of safety, please see **Safety in the Chemistry Laboratory** in the front of your book.