





Chapter 5 Lab Activity C

Mineral Identification

There are more than 2000 different kinds of minerals in the world. Rare minerals such as gold, silver, and diamond, as well as more abundant minerals such as quartz, feldspar, and mica, are all identified by their physical properties. Because minerals can be difficult to identify, mineralogists perform simple tests and examine certain properties in order to differentiate between them. In this activity, you will identify minerals by observing and investigating their physical properties such as hardness, color, luster, cleavage, fracture, and streak.

Procedure


- 1 Obtain a mineral from the mineral set and record the sample number in the data table.
- 2 Observe and record the color of your sample in the Mineral Identification Data Table.
- 3   Put on your safety goggles and your lab apron.
- 4  **CAUTION:** Always keep the streak plate on the table when testing. A streak plate could break in your hand and cause a serious cut. Place a streak plate flat on the table. Rub the sample across the streak plate. If the mineral is softer than the streak plate, it will rub off and leave a trail of powder. Record the color of the powder you see in the data table. If the mineral is harder than the streak plate, the mineral will not leave a streak. Record "no streak" in the streak column of the data table.
- 5 Examine the surfaces of the sample. Write "cleavage" if the sample has broken along a smooth surface or "fracture" if it has broken unevenly. Record your answer in the column labeled Cleavage/Fracture.
- 6  **CAUTION:** Always keep the glass slide on the table when testing. A glass slide could break in your hand and cause a serious cut. Test each sample for its hardness. Attempt to scratch the mineral with your fingernail, a penny, a glass slide, and a steel nail. Using Mohs' Scale of Hardness on page 106 of your text, record the hardness number for the sample in the data table.
- 7 Observe how the sample reflects light. Does it look metallic? Record "metallic" or "nonmetallic" in the column labeled luster in the data table.
- 8 Test each of the metallic minerals with the bar magnet. Hold a bar magnet lightly between your thumb and forefinger. If any mineral is magnetic, note this in the column labeled special properties.
- 9 Repeat Steps 1–8 for each of the numbered minerals.

LAB SKILLS AND OBJECTIVES

- *Observe, describe,* and *compare* the properties of minerals.
- *Identify* a set of minerals by their properties.

MATERIALS

- numbered mineral samples
- safety goggles
- lab apron
- streak plate
- penny
- glass slide
- steel nail
- Mohs' Scale of Hardness, Chapter 5, page 106 of your text
- Appendix A: Properties of Common Minerals, pages 700–701 of your text
- bar magnet
- extremely dilute hydrochloric acid
- eyedropper

- 10 Use the Properties of Common Minerals chart on pages 700–701 of your text to identify the minerals. Write the correct name of the mineral in the last column of your data table. Answer Analysis and Conclusions Questions 1–7.
- 11  **CAUTION:** Hydrochloric acid is corrosive to skin and eyes. Wash off spills or splashes with plenty of water. Use the eyewash fountain if hydrochloric acid gets in your eyes. Call your teacher. One method of confirming your identification of calcite is to use the acid test. With an eyedropper, place one drop of dilute hydrochloric acid on the mineral specimen you identified as calcite. What is the reaction? Record your answer under the special properties column of your data table. Answer Question 8.
- 12 Use the Properties of Common Minerals chart on pages 700–701 to help answer Questions 9–13.

Analysis and Conclusions

- 13 Some minerals can be identified by a single property. Sulfur is one example. What property is most useful for the identification of sulfur?
- _____
- 14 What color is biotite? List two other properties that are useful in identifying biotite.
- _____
- 15 There is a second mineral that belongs to the same mineral group as biotite. What is this mineral and its mineral group? How does its color compare to that of biotite?
- _____
- _____
- 16 Explain why the feel of gypsum and talc can be used to distinguish between the minerals.
- _____
- _____
- 17 Explain how cleavage and fracture can be used to distinguish between halite and calcite.
- _____
- _____

6 What are the three most useful properties for the identification of halite?

7 What are the three most useful properties for the identification of olivine?

8 Describe the reaction which took place when hydrochloric acid was dropped on the calcite mineral sample.

9 Name at least one property which was not tested in this activity that can be used to distinguish minerals.

10 How could one distinguish a sample of muscovite from a sample of biotite?

11 How could one distinguish a sample of pyroxene from a sample of amphibole?

12 Why is streak a poor property to test when trying to distinguish between the minerals calcite, corundum, quartz, and talc?

13 Name two different varieties of feldspar. Describe how one can distinguish between these two varieties.

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