

Mineral Properties

Name _____

Partner(s) _____

Class section _____ Date _____

Lab section _____

Objective:

- 1) By the end of this exercise, students will be able to demonstrate knowledge of the standard properties used to identify minerals.
- 2) By the end of this exercise, the students will be able to identify many minerals by sight.

Safety Precautions: Be sure not to taste any of these minerals unless specifically directed to do so by the teacher. Be sure to thoroughly wash your hands with soap and water after completing each day's lab work.

Procedure:

- 1) Define each of the following properties used to identify minerals:
 - a) color _____
 - b) streak _____
 - c) luster _____
 - d) hardness _____
 - e) cleavage _____
 - f) fracture _____
- 2) Following the instructions given you by the teacher, fill in the chart (found of the separate sheet) describing the way that the minerals in the chart demonstrate the properties listed.

Finding the density of a mineral

1. Take small piece of apatite or garnet and do these steps in the order they are written.
 - a) write down the name of the mineral you have chosen: _____
 - b) use a triple beam balance to determine its mass to the nearest tenth of a gram.
Mass = _____
2. Put some water into a graduated cylinder and record the volume of the water alone
Volume of water alone _____
 - a) Add the piece of mineral to the water in the graduated cylinder. Read the volume
Volume of mineral and water _____
 - b) Subtract the volume of the water from the combined volume of the mineral and the water. This will be the volume of the mineral by itself.
Volume of mineral and water – volume of water alone = mineral alone

$$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

3. Use the equation density = mass / volume to calculate the density of the mineral.

SHOW ALL WORK BELOW.

- a. write down equation
- b. substitute numbers
- c. calculate and write answer with proper units.

4. The actual density of apatite is _____ and garnet is _____. Use the percent deviation calculation to calculate how different your answer is to the “official” number.

$$\text{Percent deviation} = \frac{\text{difference from accepted value}}{\text{accepted value}} \times 100$$

- b. substitute numbers
- c. calculate the answer, the unit is %

5. The density of orthoclase feldspar is 2.6g/cm³. If you mass a piece of feldspar and find that its mass is 120.8g, you can calculate volume by using the equation $d = m/v$ and manipulating it. Calculate volume. SHOW ALL WORK.

- a. write down equation
- b. substitute numbers
- c. calculate and write answer with proper units

6. The density of gypsum is 2.4g/cm^3 . If the volume is 32.8cm^3 , calculate the mass.

SHOW ALL WORK.

- a. write down equation
- b. substitute numbers
- c. calculate and write answer with proper units

For Further Research:

Go out to the internet, your textbook, the reference books in Room 140, the encyclopedias and other references in the Media Center, or other references to which you may have access and find out what at least five (5) of these minerals are used for. Tell what industrial, commercial, gemological, or other reason the five minerals you look up are important to human beings. In addition, find at least one (1) place where these minerals are found and list that information as well. **Do this on a separate sheet of paper which you will attach to this lab report.**

Special Prop?

Mineral	Color	Streak	Luster	Hardness	Cleavage/Fracture
Augite/ Pyroxene					
Calcite					
Dolomite					
Feldspar/ Plagioclase/ Microcline					
Feldspar/ Orthoclase Pottasium					
Fluorite					
Galena					
Garnet/ Almadine					
Graphite					
Gypsum					
Halite					

Mineral	Color	Streak	Luster	Hardness	Cleavage/Fracture
Hematite					
Hornblende /Amphibole					
Kaolin					
Magnetite					
Mica/ Biotite or Muscovite					
Olivine					
Pyrite					
Quartz— Amethyst Citrine Tiger Eye					
Sulfur					
Talc					

Note density of garnet = 3.5 g/cm³
Apatite = 3.1 g/cm³