Laboratory Investigation Name _____

Chemistry: Form L4.3A Date _____ Period _____

Examining Crystal Structure

PROBLEM

What are the characteristic shapes and angles of some crystals?

INTRODUCTION

In true solids, the particles are arranged to form crystals. The surfaces or faces of a crystal are at fixed angles to each other. If a crystal is split into smaller pieces, each piece will have the same number of faces and the same angles. Crystals look the same shape even when they are viewed from different angles. This is because crystals are symmetrical. The characteristic shape of each crystal, including its symmetry, the number of faces, and the characteristic angles, is due to the repetitive arrangement of the particles that make up the crystal. Ionic compounds form typical crystalline solids. In this laboratory exercise, you will examine the characteristic shapes of some ionic crystals and use this information to identify an unknown.

MATERIALS (*per group*)

Crystals (barium nitrate, magnesium sulfate, potassium chloride, sodium chloride, sodium thiosulfate, etc.); glass slide; magnifying glass; microscope; scoop

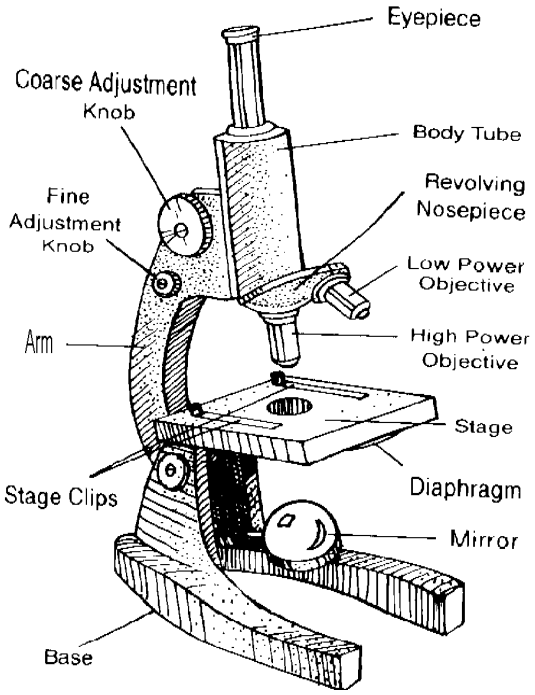
PROCEDURE

1. Using a scoop, put a small amount of one of the crystals on a clean glass slide. Do *NOT* put any water on the slide.

2. Refer to the diagram of the microscope to the right as you follow the directions below for using the microscope: **[a]** Place the slide containing the crystals on the stage of the microscope. **[b]** Turn to the low power objective (the shortest one). **[c]** Turning the coarse adjustment away from you, lower the objectives as far as you can without touching the crystals. **[d]** Look through the eyepiece and adjust the mirror so that the field of view is bright. **[e]** As you look through the eyepiece, turn the coarse adjustment toward you until the crystals come into view. **[f]** Then use the fine adjustment to focus the image of the crystals.

3. Write the name of the crystal you examined in the data table on the next page. Record the color of the crystal in the data table. Draw a diagram of the crystal showing the characteristic faces and angles.

4. Repeat the entire procedure described in step 1 through step 3 until you have examined all of the available crystals, saving the unknown for last.



5. After examining all of the crystals, compare the unknown to the other crystals. Based on the characteristic faces and angles, identify which of the other crystals is the same as the unknown.

OBSERVATIONS

Name of Crystal	Crystal Color	Diagram
Unknown		

CONCLUSIONS

1. What is the identity of the unknown? _____

2. How do two crystals of the same substance compare to each other? How do two crystals of different substances compare to each other? _____

_____

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3. What characteristics of the crystals you examined did you use to identify the unknown?

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