Laboratory Investigation Name _____

Chemistry: Form L4.3.1A Date _____ Period _____

Examining Crystal Growth

PROBLEM

How do crystals form?

INTRODUCTION

Crystals form in several ways. When molten solids cool down and resolidify, crystals often form. Some gases may undergo reverse sublimation to form crystals. As the water in a solution evaporates, crystals may form. Crystals also form in supersaturated solutions when a single additional crystal is added. As a crystal grows, the particles of the solid arrange themselves in regular, geometric patterns, pulled there by the forces of attraction that hold the solid together. In this laboratory investigation, you will observe the growth of a crystal around a single crystal added to a supersaturated solution.

MATERIALS (*per group*)

Beaker; Bunsen burner; crystals (hydrated sodium thiosulfate); depression slide; forceps; medicine dropper; microscope; safety goggles; scoop; striker or matches; tongs

PROCEDURE

1. Using a scoop, fill the well of a depression slide with sodium thiosulfate crystals. Put the slide on the stage of a microscope. Switch to low power and adjust the mirror so the field of view is bright. Focus on the crystals using the coarse adjustment. Then remove the slide from the stage of the microscope.

2. Put some water in a small beaker. Using a medicine dropper, put ***one*** drop of water on the crystals in the well of the depression slide as shown in Figure 1 below.

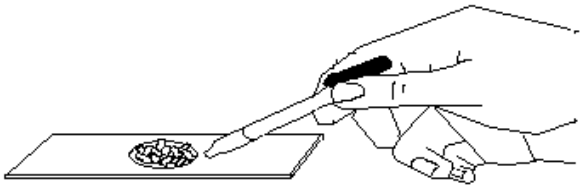

Figure 1. Put only one drop of water on the crystals.

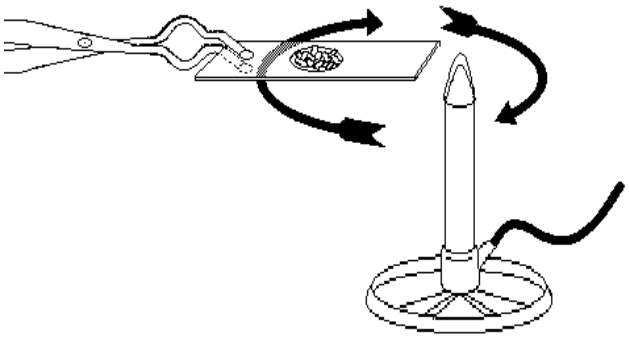

Figure 2. Move the slide in a circular motion in and out of the flame.

3. Put on safety goggles and light your Bunsen burner. Using tongs, move the slide in a circular motion so that the part of the slide where the crystals are located passes quickly through the flame and then back out as shown in Figure 2 above. *CAUTION: Do NOT hold the slide in the flame for more than an instant.* Using the same circular motion, continue passing the slide in and out of the flame until the crystals are completely dissolved.

4. Put the slide on the stage of the microscope. Using forceps, drop a single crystal into the liquid on the slide. Focus on the crystal and watch the crystal grow. As the crystal grows, draw a sketch showing what the growth process looks like in the space provided below. Make at least three drawings of the crystal in different stages of growth.

OBSERVATIONS

Drawings of Crystals

CONCLUSIONS

1. How do the shapes of the developing crystals compare to the shape of the crystal you dropped into the liquid on the slide? Why? _____

2. Which of the methods of crystal formation described in the introduction did you observe? _____

3. Why did the addition of a single crystal cause the crystallization to occur? (Hint: There are forces of attraction between the particles in the crystal.) _____