

Re-crystallization of boric acid



**ASSIGN
BUSTER**

The purpose to conduct this lab is recrystallization of solid and then identify the effect on solids purity and yield.

Part A: Reactions

Table 1. quantitative and qualitative observations of reactions to form boric acid.

Mass of borax (g) 10.0558g

Appearance of borax White powder

Time for solubility of borax (min) 5min

Time for boric acid crystals to form (min) 12min

Part B: Filtration

Table 2. mass of watch glass and filter paper, mass of watch glass, filter paper and wet crystals from filtration and qualitative observations of crystals after filtration.

Mass of watch glass¹ and filter paper¹(g) 33.3364g

Mass of wet crystals, watch glass 1, filter paper from filtration(g) 44.6083g

Appearance of crystals after filtration Soft, white solid

formation.

Part C: Re-crystallization

Table 3. mass of watch glass and filter paper, mass of watch glass, filter paper and wet crystals from recrystallization, and qualitative observations of crystals after recrystallization

Mass of watch glass ² and filter paper ² (g)	25. 2834g
Mass of watch glass ² , filter paper ² and recrystallization (g)	28. 0524g
Appearance of crystals after recrystallization	White shiny crystal in solid.

Part D: Purity test

Table 4. qualitative observations for the purity test of crystals collected after filtration and recrystallization

Observations of test tube 1, containing crystals after filtration, upon reacting with AgNO_3	Observations of test tube 2, containing crystals after recrystallization, upon reacting with AgNO_3
White precipitates formed Cl^- are present , AgCl formed.	Solution is clear, Cl^- are not present.

Table 5. mass of watch glass, filter paper and crystals, and qualitative observations of crystals, after recrystallization and drying.

Mass of watch glass 2 + filter paper + dried crystals from
recrystallization (g) 27.4848g

Appearance of crystals White solid formation, shiny appearance.

1. Calculate the wet mass of crystals after the filtration and the recrystallization, and dry mass of crystals after the recrystallization. summarize your results on ONE table (you should have 3 masses recorded in this table)
 2. Write the balanced chemical equation for the reaction to produce boric acid. Determine which reactants the limiting reagent. Show all of your work.
 3. Calculate the theoretical yield of boric acid. show all your work.
 4. Calculate the yield of boric acid based on the dry mass of the crystals.
 5. Calculate the solubility of boric acid in the water at 25 °C and 80 °C using the equations of the best-fit curves that are found in figure 3-2.
1. Explain Why water was an appropriate solvent to use for recrystallization in this lab.
 2. Explain the differences observed in the appearance of the crystals after filtration compared to the crystals after recrystallization
 3. a) Explain how the purity test is used in this lab to determine the purity of the product (include a balanced chemical equation in your answer).
b) based on your observations, are the crystals that you collected following recrystallization pure? Explain your answer.

4. Other than performing the purity test that was performed in this experiment, explain two other methods that can be used to determine the purity of a product.
5. Discuss the percent yield result. Fully explain two reasons (sources of error) for the loss of product during the experiment, including the specific step at which product was lost. Also explain how each of the losses can be minimized.
6. If you recrystallized the crystals again, what would you expect to happen? Explain your answer.
7. If during crystallization the solute fails to crystallize, what can be done to include the crystals to form? Explain two ways to induce crystal formation.