Experiment No. 19: Copper: Its Chemical Transformations

Parts C and D

You will make the cis-glycinato and aspirinate compounds of copper. There will not be any filtering, but some centifuging. The melting points will not be determined because there is not sufficient time to properly dry the compounds. Besides, they are not really "melting points" in this case, but the temperature at which the compounds decompose. There will be an opportunity to measure real melting points during a future experiment.

It appears that for many of you crystals of copper acetate are forming in your solution from last week. You will need to dissolve them. Check out 3 stir bars, 1-triangle and 2-+'s , set up the 125-mL flask with water to heat during the pre-lab. Once you have a solution again, divide it into two parts. If you stored your copper acetate from last week in two centrifuge tubes, combine them and then divide into 2 parts.

One of the two parts will be used to make the glycinato complex. Follow the procedure in the book. Be sure to cool the solution to room temperature before adding the alcohol. Keep in mind that any time you are attempting to recover a solid product from a solution, you should minimize the amount of solvent. Some product will always be lost because it stays dissolved; the more solvent that remains, the more product is lost. If the amount of solvent is in too much excess, you may not be able to get any product. This can result in the laborious task of boiling off the solvent, which in turn can destroy the product because of the excess heating. If you have trouble precipitating the glycinato compound, you may be able to force it out by adding more alcohol.

The amount of aspirin indicated in the lab manual for preparing the copper (II) aspirinate is inadequate. It is only about one-sixteenth of the stoichiometric amount needed for the estimated copper in solution. Use about 700 mg of aspirin per 8-10 mL of alcohol. This may be adjusted again later.

Follow your TA's instructions for recovering the copper metal after washing with acetone.

Last week, a lot of time was wasted centrifuging. That was my fault for not being more alert to what was happening. The amount of time needed to centrifuge depends on the natures of the solid and the liquid medium. Heavy precipitates can often be separated in a matter of seconds, while finer ones can require many minutes, or even hours. If the liquid phase is oily or syrupy, it will usually require much longer for the separation than for water. The CuO is heavy and easily separated. After turning on the centrifuge, allow it to come up to full speed for one minute, then turn it off and allow it to stop on its own. This will be more than adequate for CuO.

By the way, the structure for acetylsalicylic acid shown on page 414 of the lab manual is incorrect. The methyl group (-CH_3) should be bonded directly to the other carbon atom, and that

carbon atom should be bonded to an oxygen, which is then bonded to the ring. In other words, the single-bonded oxygen atom is on the wrong side of the double-bonded carbon atom.