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As in Step I, a little of the precipitated material can be set aside for study of the crystalline structure of the material.

STEP III

Allow the precipitate from Step II to settle and decant the liquid. The precipitate should be washed twice more with 15-20 ml distilled water and decanted each time.

To the washed precipitate add 2 M sulfuric acid (H_2SO_4) dropwise until the precipitate just dissolves. The equation for the reaction is:

$$Cu(OH)_2 + H_2SO_4 \longrightarrow CuSO_4 + H_2O$$

or

$$CuO + H_2SO_4 \longrightarrow CuSO_4 + H_2O$$

Again, as in Steps I and II, several drops of the resulting solution can be dried for examination of copper sulfate crystals.

STEP IV

At this point the solution is again made basic with 6 M NaOH. To the basic solution add 10 ml of 1 M sodium phosphate (Na_3PO_4) solution. Stir well and examine the crystal structure of the precipitate as before. The equation for the reaction is:

$$CuSO_4 + Na_3PO_4 \longrightarrow Cu_3(PO_4)_2 + Na_2SO_4$$

Test the solution at this point to make sure that it is basic. If necessary, add 6 M NaOH dropwise, stirring after each addition until the solution shows basic to litmus.

Pre-weigh a piece of filter paper and filter the mixture. Wash three times with 10-15 ml distilled water. Discard the filtrate. Dry and weigh the residue. Determine the percent yield, keeping in mind that 63.5 g copper should form 126 g of $Cu_3(PO_4)_2$.

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