Synthesis of Prussian Blue

Materials:

Item	Amount per student	Amount for 24 students
Iron (III) Chloride ($FeCl_3$)	4 g	96 g
Potassium Ferrocyanide ($K_4[Fe(CN)_6]$)	1.5 g	36 g
Filter paper	1	24

Equipment:

Item	Amount per student	Amount for 24 students
Buchner funnel	1	24
Filter flask	1	6
Tubing	1	6
Filter-vac rubber rings (for suction flasks)	1	6
Scissors	1	12

Staff Notes: Please set up the aspirators prior to class.

Safety Notes:

- $FeCl_3$ is an irritant (used to deodorize sewage!) and is hygroscopic. Please keep the bottle tightly capped.
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Procedure:

1. Prepare a saturated solution of iron (III) chloride by placing 3.7 g $FeCl_3$ in a small beaker with 5 mL distilled water. Use a graduated cylinder to measure the volume of water you used. Stir to dissolve.
2. Separately, prepare a saturated solution of potassium ferrocyanide by placing 1.39 g $K_4[Fe(CN)_6]$ in another beaker with 5 mL distilled water. Describe the appearance of these solutions in your LNJ.
3. Make the Prussian Blue by pouring the potassium ferrocyanide solution into the beaker with the ferric chloride solution. Stir with a glass rod. Describe in your notebook EXACTLY what you see happen when the solutions are mixed.
4. Obtain filter paper that fits the Buchner funnel (so it lays flat in the bottom). Set up the aspirator by connecting a piece of tubing from the little side-arm on the filter flask to the similar arm sticking out from the side of the faucet. Put the neck of the Buchner funnel

through a Filter-vac rubber ring, then seat it into the top of the filter flask. If your filter flask is small, you may want to clamp it into place.

5. Turn on the faucet to create suction. Then pour your reaction mixture into the funnel. Scrape the entire blue product into the funnel: use a little distilled water to rinse the beaker.
6. Once the liquid has all drained into the flask, gently remove the hose from the filter flask to break the suction. Turn off the water. Put your filter paper on a few paper towels inside your lab drawer, and let your Prussian Blue dry until the next lab period. Describe the appearance of the pigment, both while it is wet and after it dries.

Reflections:

1. Write the reaction that is proceeding in this synthesis.
2. Find several other purposes for this substance, besides as a colorant in paints.