

Laboratory Experiment Proposal Submission

Experimental Details

Experiment location: A115
Experiment title: Synthesis of Prussian blue analogue films
Experiment date: ongoing
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Chemicals Used

<u>Chemical Name</u>	<u>Health</u>	<u>Flammability</u>	<u>Reactivity</u>	<u>Special Hazards</u>
Water	0	0	0	NONE
Nitrogen	0	0	0	
Nickel Nitrate Hexahydrate	1	0	1	OX
Potassium Hexacyanochromate(III)	0	0	0	NONE
Rubidium Nitrate	2	0	2	OX
Cobalt Nitrate Hexahydrate	3	0	2	OX
Potassium Hexacyanoferrate(III)	0	0	0	NONE

Reactants and Resulting Samples

<u>Chemical Name</u>	<u>Hazardous?</u>	<u>Known Hazards</u>
Prussian Blue Analogue Film	N	

Required Safety Equipment

- Hood Organics

Required Laboratory Equipment

- Balance
- Hot Plate
- Ftir
- Uvvis Spectrometer
- Xray Diffractometer

Experimental Write Up

*Put on gloves (and lab glasses)

1. Weigh reagents

- a. 145.395 mg of $\text{Ni}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$
- b. 164.21 mg of $\text{K}_3[\text{Cr}(\text{CN})_6]$
- c. 92.1688 mg of RbNO_3
- d. 72.7575 mg of $\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$
- e. 329.24 mg of $\text{K}_3[\text{Fe}(\text{CN})_6]$
- f. 92.1688 mg of RbNO_3

2. Make solutions of reagents

- a. 10.0 mM $\text{Ni}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}(\text{aq})$ in 50 mL to give solution (1)
- b. 10.0 mM $\text{K}_3[\text{Cr}(\text{CN})_6](\text{aq})$ and 12.5 mM $\text{RbNO}_3(\text{aq})$ in 50 mL to give solution (2)
- d. 5.0 mM $\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}(\text{aq})$ in 50 mL to give solution (3)
- e. 20.0 mM $\text{K}_3[\text{Fe}(\text{CN})_6](\text{aq})$ and 12.5 mM $\text{RbNO}_3(\text{aq})$ in 50 mL to give solution (4)

3. Fill large flask with 500mL to 1000 mL water for washing each film subsequent to deposition

4. prepare films

- a. dip substrate into a divalent metal containing solution (i.e. (1) or (3))
- b. dab excess solution on paper towel
- c. dip substrate into a monovalent and trivalent metal containing solution (i.e. (2) or (4))
- d. dab excess solution on paper towel
- e. rinse film with water
- f. repeat as desired
- g. wash film with water and methanol, dry under nitrogen

Experimenter Signature: _____

Date: _____

Lab Responsible Signature: _____

Date: _____