



5	Feb. 7-9 (M-W)	<b>Expt:</b> Synthesis of $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$	All	Teams of two
6	Feb. 14-16 (M-W)	<b>Orientation:</b> The Solid State: An Introduction <b>Expt:</b> Solid State Structures: Closest Packing and Unit Cells	All	Teams of two
		<i>Include only the brief, general procedure. Instructions in the lab manual will be used during lab. A detailed, hand-written procedure is not required for each model constructed!</i>		
	Feb. 16 (W)	<b>Last Day to Drop</b>		
7	Feb. 21-23 (M-W)	<b>Orientation:</b> High Temperature Superconductors: An Introduction <i>Background, synthesis, pellet preparation, and magnetic susceptibility measurements will be discussed.</i>		
		<b>Expt:</b> Synthesis and Properties of $\text{Y}_1\text{Ba}_2\text{Cu}_3\text{O}_x$ , a High Temperature Superconductor (Week 1)	All	
		<i>Procedures for the synthesis, pellet preparation, and sintering should be complete prior to this lab meeting. This represents one experiment. Begin the synthesis of the superconductor.</i>		
		<i>Teams 1/2, 3/4, 5/6 will work cooperatively on the initial synthesis.</i>		Teams of four
		<i>Construct model of unit cell of 1-2-3 superconductor</i>		Teams of two
		<i>Extra time must be scheduled prior to the next lab meeting for sample recovery, pellet preparation, and pellet sintering.</i>		
8	Feb. 28-Mar. 2 (M-W)	<b>Expt:</b> Synthesis and Properties of $\text{Y}_1\text{Ba}_2\text{Cu}_3\text{O}_x$ , a High Temperature Superconductor (Week 2) <i>The Meissner Effect</i> <i>Magnetic Susceptibility Measurements</i>	All All	Teams of two Teams of two
		<b>Orientation:</b> Conductance of Cobalt Ammine Complexes Magnetic Susceptibility of Cobalt Ammine Complexes IR Spectroscopy of Cobalt Ammine Complexes UV/Visible Spectroscopy of Cobalt Ammine Complexes		
		<i>A worksheet exercise will be completed during orientation as an introduction to these techniques. Carefully study the introductory material in the lab manual covering each of these techniques prior to orientation.</i>		
9	Mar. 7-9 (M-W)	<b>Expt:</b> Conductance of Cobalt Complexes <b>Expt:</b> Magnetic Susceptibility of Cobalt Complexes <b>Expt:</b> IR Spectroscopy of Cobalt Complexes <b>Expt:</b> UV/Visible Spectroscopy of Cobalt Complexes <i>These will be written up as <u>individual</u> experiments</i>	1,2,3 1,2,3 4,5,6 4,5,6	Assigned times Assigned times Assigned times Assigned times
	<b>Mar. 13-20</b>	<b>Spring Break (Sunday - Sunday)</b>		

- 10 Mar. 21-23 (M-W)
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| <b>Expt:</b> Conductance of Cobalt Complexes             | 1,2,3 | Assigned times |
| <b>Expt:</b> Magnetic Susceptibility of Cobalt Complexes | 1,2,3 | Assigned times |
| <b>Expt:</b> IR Spectroscopy of Cobalt Complexes         | 4,5,6 | Assigned times |
| <b>Expt:</b> UV/Visible Spectroscopy of Cobalt Complexes | 4,5,6 | Assigned times |
- These will be written up as individual experiments*
- Mar. 25 (F) State Holiday: No Classes**
- 11 Mar. 28-30 (M-W)
- Orientation:**  
Kinetics of Aquation of  $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$  All
- Expt:** Kinetics of Aquation of  $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$  All Teams of four  
(Teams 1/2, 3/4 and 5/6)
- 12 Apr. 4-6 (M-W)
- Orientation:**  
Synthesis, Separation, and Characterization of Acetylferrocene
- Study the introductory material on organometallic compounds, the synthesis of acetylferrocene, and chromatography of ferrocene derivatives in the lab manual.*
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|--|-----|--------------|
| <b>Expt:</b> Synthesis of Acetylferrocene                | All | Teams of two |
| <b>Expt:</b> TLC of the Acetylferrocene Reaction Mixture | All | Teams of two |
- These will be written up as individual experiments. Both procedures should be completed prior to lab.*
- 13 Apr. 11-13 (M-W)
- Expt:**  
Column Chromatography of Acetylferrocene All Teams of two
- The recovery of dried fractions must be completed the day following your lab meeting. Melting point determinations must be completed prior to the next lab meeting.*
- 14 Apr. 18-20 (M-W)
- Sample Collection, Lab Clean-up and Check-out**
- April 25 (M) Classes end. No lab meeting.**
- 15 April 27 - May 4 **Exam Period.**

### Useful References:

1. Z. Szafran, R. M. Pike, and M. M. Singh, *Microscale Inorganic Chemistry*, Wiley, 1991. QD155.S96 Very nice inorganic laboratory manual with good background on common techniques used in the laboratory and good collection of synthetic experiments.
2. a. G.S. Girulami, *Synthesis and Technique in Inorganic Chemistry: A Laboratory Manual*, University Science Books, 1999. QD155.G57 Good background on the ferrocene project and parts of the cobalt ammine project (synthesis and kinetics). Good background for common techniques used in the inorganic laboratory.  
b. R. J. Angelici, *Synthesis and Technique in Inorganic Chemistry*, University Science Books, 1986. QD155.A53x Good background on the ferrocene project and parts of the cobalt ammine project (synthesis and kinetics). Good background for common techniques used in the inorganic laboratory.
3. W. L. Jolly, *The Synthesis and Characterization of Inorganic Compounds*, Prentice-Hall, 1970. QD156.J65 A classic for common synthetic procedures in inorganic chemistry with specific syntheses.
4. J. Derek Woollins, Ed., *Inorganic Experiments*, Wiley-VCH, 1995. QD155.I54 2003. Contains a large number of introductory, intermediate, and advanced level experiments involving synthesis and characterization of inorganic compounds, including organometallics, as well as the application of physical techniques and catalysis.
5. L. C. Nathan, *A Laboratory Project in Coordination Chemistry*, Brooks/Cole, 1981. Very good background and detail for the cobalt ammine project. Not available in the library. Available in Dr. Evans' office..
6. J. Tanaka and S. L. Suib, *Experimental Methods in Inorganic Chemistry*, Prentice Hall, 1999. QD155.T36 Good introduction to useful basic lab techniques, laboratory exercises, and characterization techniques. Extensive exercises on the solid state.