

AP Chemistry
Independent Study Project
Coordination Compounds

The purpose of this unit is to acquaint you the student with some research techniques and to involve you in the discovery learning process. You will be given a topic to work on and some guidelines for what you should accomplish. You will work in groups of three and share your results with the other members of your group.

The problem you will be studying is a classic example of research in chemistry, the structure of a coordination compound. This work led to the first Nobel Prize awarded to an inorganic chemist Alfred Werner.

The following scientific facts about the compounds of cobalt listed below are well proven and accepted. The overall goal you have is to derive a structure for the three (four?) different compounds that agree with the data. In the process you will learn many new terms but you will also review many ideas and have to adapt them to the new subject matter.

Three formulas are known for these compounds:

Formula	Color of Compound
$\text{CoCl}_3 \cdot 6\text{NH}_3$	yellow
$\text{CoCl}_3 \cdot 5\text{NH}_3$	purple
$\text{CoCl}_3 \cdot 4\text{NH}_3$	one green and one violet

In addition the following reaction regarding the compounds are known:



Schedule of events

Bring your book everyday for this chapter!

Day One:

Ponder the question and try to devise a structure. Show “guess” structures to the teacher.
Try again.

Day Two:

Use the JCE: Software Programs on the Werner/Joergensen Controversy and on Bonding.
Work through these with a partner. Keep notes on what you do.

Try for another structure based on this information

Day Three:

Vocabulary Assignment. Work with a partner.

Day Four:

Isomer Assignment. Work with a partner.

Day Five

Nomenclature Assignment. Work with a partner.

Day Six:

Laboratory exercise on complex ion formation.

Day Seven:

Assignment on complex ion reactions. Work with a partner.

Day Eight:

Lab exercise on ligands.

Day Nine:

Discuss results and review for test.

Day Ten:

Test