

Pre-lab: Experiment 19 - Line Emission Spectra and Flame Tests

Format & Clarity of the Report: See lab report checklist. You are graded on how you format the lab and record your data, not just data collection..

Before class starts: Read the lab for the week carefully before you start writing your pre-lab. The purpose, introduction, and procedure should be neatly written in your lab book before class starts. Keep the introduction and the purpose separate. Prelab questions need to be correctly answered.

Spacing: You will probably use 1 pages for your purpose and procedure, 1-2 pages for the data table. If you allot an appropriate amount of space, you will not have to mix labs together if you have to do more than one in a week. You will lose points for poorly formatted labs. The rest of the lab is turned in on a report sheet.

Purpose: Address the following in your purpose: At the end of this lab, what are you expected to accomplish. The first page of the introduction in the lab manual addresses this issue.

Introduction: YOU ARE NOT WRITING AN INTRODUCTION. Please read the ancillary handouts. They will help you answer questions. Some of this material is on exams. In the handout, 'Subshell Activity' there are several problems for you to look at but you do not have to answer the questions (some are incorporated in this lab.) This handout will give you insight into the energy arrangement of atoms in electron configuration. I have highlighted parts that are of particular interest as it pertains to other information about the Pauli Exclusion Principle, and subshell energy splitting. 'L7 photoelectron spectroscopy', presents similar material as in the first handout, and discusses the experiment process. (the process is not on the test. "ChemAct_07 has questions that you will answer as part of the lab.

Pre-lab questions: These words and phrases might give clarity to your answers:

- Each metal has a unique electron configuration
 - Electrons
 - Absorb and release energy
 - Ground state, excited state, back to ground state
 - Visible light, etc
 - Specific wavelength and frequencies relate to color
 - Energy to move electrons
1. What do the initials PES represent?
 2. What information does PES data give us about the energy level of electrons in the atom?
 3. What is the difference between PES data and ionization energy? (you might have to read ahead, but the information is also given in these handouts.)
 4. What is the significance of the intensity of the peaks in PES to the energy?
 5. What causes light to be emitted from an atom?
 6. Why are only certain wavelengths emitted from an atom? (In other words, why do the spectra show lines of light instead of a continuous rainbow of light?)
 7. Why does hydrogen emit different wavelengths of light than mercury?

Procedure: This lab is an observation lab. Follow the instructions.

Qualitative Observations/Data Collection: Your observations should be written in the observation section of your lab report. You should record the appearance of each solution before you test it, and the color of the flame afterwards.?

There are a lot of observations. So, what is an observation?

Good observations: I saw 5 lines for the unknownium spectrum. They are from left to right, brown, orange, green, teal, and red violet.

Bad observations: brown, orange, something? What element was that?

Really bad observations: writing down nothing at all.

Data Tables: is part of the report sheet titled results

Calculations:. Lots of calculations, but they are all on the report sheet.

Graph:. No graph.

Results Tables: is part of the report sheet titled results

Questions: See lab manual and report sheet.

Attachments and Other Information: You need to read the handouts associated with this lab.

READY TO TURN IN THIS LAB?

You should have the observation section filled out in your lab book. Copy your observations neatly to the handout provided on the web site. Answer the questions on the handout. Turn in the copy sheet from your lab book (could be yellow, could be white-depends on your book), the results table, and the answers to the questions (all on report sheet). Make sure your name (and your partner's) is on everything. Attach any other handouts as requested in the agenda.