

CHEM 111L Midterm Exam Topic list Spring 2017

Exam in recitation March 20th

Be sure to study pre- and post- lab questions and those ChemPages modules! What we are looking for is your *understanding* of the lab procedure/technique/data analysis, you will NOT be asked to regurgitate the procedure. Can you manipulate the data? Do you understand the significance of adding/using a particular reagent? Can you create spreadsheet formulas to do calculations? Do you understand where potential errors (uncertainties) are?

Is this exam important? It is worth 160 lab points (that's equivalent to FOUR lab reports!).

1. Basic Lab Techniques

- correctly reading measurement devices
- accuracy versus precision
- determine mass and volume delivered by a pipet (like in lab)
- calculate percent error
- ChemPages on the "Balance", "Pipet, Volumetric", "Bulb, Standard", "Graduated Cylinder" (plus 100 mL in Additional Topics), and "Scales" (and the Self-Check Exercises in Additional Topics)

2. Paper Chromatography

- interpret a chromatogram
- calculate R_f values and know what factors affect R_f values
- chromogenic reagents (what are they generally, what ones were used specifically, what was the purpose of the ones you used)
- ChemPages on "Chromatography, paper" (plus Self-Check Exercises)

3. Physical Properties

- density calculation via displacement method or mass & volume data
- using a calibration curve (like in lab...be sure you can rearrange $y = mx+b$ to solve for x)
- ChemPages on the "Balance" (and all Additional Topics), the "Pipet, Volumetric", and the "Bulb, Standard"

4. Hydrogen emission

- Components of the spectroscope
- You will be given the Rydberg equation, but you will have to know $c=\lambda\nu$ and $E=h\nu$. You will be given any constants you will need.
- Be able to construct a miniature energy level diagram given the appropriate information
- Be able to interpret an energy level diagram
- Be able to calculate ΔE from wavelength, be able to find n_i and n_f
- Given a calibration curve (and equation of the line) of wavelengths versus scale reading, determine the corresponding wavelength from a given scale reading
- ChemPages on "Spectroscope, hand-held" and "Vernier scales (under the Scales module, additional topics)