

CHEM 221 Objectives- Louka/Yan:

- **Distinguish** between specific gravity and density. **Use** specific gravity and % to **prepare** any molarity from the original acid or base bottle.
- **Determine** which unit to use according to temperature dependence.
- **Compute** various types of experimental errors, statistics and probability, **understand** the method of least square and **construct** calibration curves.
- **Calculate** various equilibrium constants in analytical chemistry.
- **Learn** about the standard reduction potential table and how each potential value was **determined**.
- **Describe** the fundamentals of electrochemistry, galvanic cells, Nernst Equation, E° and the equilibrium constant. **Learn** the standard conditions. **Distinguish** the difference between E_{Cell} and E°_{Cell} .
- **Recognize** types of electrodes and potentiostate, Ion-selective electrodes, indicator electrodes, counter electrodes and reference electrodes and **determine** when they should use each one.
- **Learn** pH meter and how does it work, including the functions of the parts of the sensor. **Recognize** errors and be precautious when using this electrode.
- **Determine** the amount of a reactant quantitatively using gravimetric techniques.
- **Describe** the absorption process in terms of Beer-Lamberts Law; **calculate** concentrations using the Beer-Lambert law.
- **Understand** about the fundamentals of spectrophotometry, Beer's Law, absorption of light and chromophores. **Recognize** the difference between excitation and emission spectra.
- **Understand** difference between luminescence and chemiluminescence. **Differentiate** between atomic and molecular spectrophotometers.
- **Describe** the specific instrumentation required for atomic, UV-visible absorption and Fourier Transform Infra-Red (FTIR) spectrophotometers.
- **Learn** the components of the spectrophotometric technique instruments. **Describe** the function of each part.
- **State** the types of chemical substances that can be **determined** by each type of spectroscopic analysis.
- **Describe** the fundamental basis for chemical separation processes with an **emphasis** on chromatographic separation. **Introduce** the students to the basic components of a gas and liquid chromatography and the application and limitations of these chromatographic systems.
- **Understand** the relationships between the operational and measurable parameters of chromatography and **perform** calculations using them.