

SAULT COLLEGE

OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE

CHM 200-6

COURSE OUTLINE

Analytical Chemistry I
Laboratory

CHM 200-6

REVISED: May, 1980 by J. Korrey



COURSE OUTLINECHI 200-6ANALYTICAL CHEMISTRY I - LABORATORYGRAVIMETRIC ANALYSIS

1. Determination of Iron by precipitation with ammonia
2. Determination of Nickel with Dimethylglyoxime

OPTIONAL EXPERIMENTS

3. a) Determination of Sulfur in Coal or Coke
b) Analysis of Sulfate in a soluble Sulfate
4. Determination of Iron by Homogeneous precipitation
5. Determination of Tin and Zinc in Brass (preparation for brass analysis by electrodeposit in Semester 4)

VOLUMETRIC ANALYSIS

6. a) Preparation and Standardization of Acid-Base solutions
b) The determination of Sodium Carbonate in Soda Ash
7. Potentiometric Titrations (using the pH Meter)
 - a) Titration of a polyprotic acid
 - i) determination of the concentration
 - ii) determination of the dissociation constants K_1 & K_2
8. Redox Titrations with Permanganate.
 - a) Standardization with Sodium Oxalate
 - b) Determination of Oxalate in an unknown
9. The determination of Copper in ores with Sodium Thiosulfate

OPTIONAL EXPERIMENTS

10. EDTA Titrations
 - a) the Determination of Calcium and Magnesium in Water and calculation of total hardness as calcium carbonate.
11. Specific Ion Electrodes
 - a) Determination of chloride in Tomato Juice
 - b) Determination of Calcium in milk
 - c) Determination of the Behaviour of a Sodium Ion Electrode
12. Colourimetric Measurements - Spectronic 20
 - a) To determine the optimum wavelength to use in an analysis
 - b) Proof of adherence to Beer's Law - for $\text{Cr}(\text{NO}_3)_3$
 - c) To analyze a two-component mixture & study the effects of interferences.

COURSE OUTLINE

ANALYTICAL CHEMISTRY I - CHM 200-6 LABORATORY

TOPIC DESCRIPTION

Introduction

General Directions

- Prepare
- 1) a safety bottle
 - 2) Stirring Rods - 6 of different lengths
 - 3) Dessicator - prepare using drierite or Calcium Chloride
 - 4) Reagents - see paragraph 2
 - 5) Cleanliness
 - 6) Records - keeping of notebooks

Suggestions for work

The Analytical Balance

Omit most of chapter with the following exceptions:

- mass and weight
- Care of the Balance
- Errors in Weighing
- Weighing of samples and precipitates

Visual Aid - see film strip "Analytical Balance" #15

Laboratory Tools and Operations of Quantitative Analysis

Note: Read all this chapter - It is very IMPORTANT

Prepare a cleaning solution for cleaning burets, pipets, etc.

ANALYTICAL CHEMISTRY I - CHM 200-6 LABORATORY

TOPIC DESCRIPTION

Laboratory Tools and Operations (con't)

Omit section on calibration but read section on

Technique of reading Volumetric Apparatus

Method for filling a pipet - use an aspirator bulb

Method for draining a pipet - see film strip #10 in lab

Quantitative transfer of solutions

Filling the buret (see note regarding reagent stoppers)

Proper technique in using a buret (see film strip #11 in Lab)

Method of folding filter paper (see film strip #9 in Lab)

Use of suction

Ignition and method for bringing crucibles to constant weight

Evaporation - note Precautions.