

Homework Chapters 0, 1, 2

Due Monday, January 23

Chapt. 0: 0-1, 0-4

Chapt. 1: 1-4, 1-13, 1-17, 1-18, 1-22, 1-27, 1-31

Chapt. 2: 2-1, 2-5, 2-7, 2-10, 2-18, 2-21

Extra Credit: Email Dr. Ingram (jani.ingram@nau.edu)
Information about yourself (major, career goals), where you are from, anything else. Also due Friday, Jan. 27

CHM 320: Analytical Chemistry

Spring 2006

Northern Arizona University, Department of Chemistry

Instructor: Dr. Jani C. Ingram

Office: Chemistry Rm 219

Phone: 928-523-7877

Office Hours:

Monday 10:30 to 11:20 am

Wednesday 12:30 pm to 1:30 pm

or BY APPOINTMENT

Prerequisite:

CHM 152 or CHM 230 – Concurrent enrollment in CHM 320L is recommended.

Course Description:

Description – An introduction to the principles and practices of chemical analysis, with an emphasis on stoichiometry and equilibrium calculations will be presented.

Grading Policy:

Homework - Homework assigned from problems in the text book will be assigned, collected, and graded at the end of each chapter. At the end of the semester, your homework score will be normalized to 100 points (**the equivalent of one hour exam**) by dividing your total homework points by the maximum total points possible for all the collected homework sets. There will be a 10% late penalty for each class period that a homework set is turned in late (up to 3 class periods).

Exams – Three 60 minute exams will be given during class on the following dates:

Friday, February 24

Friday, March 17

Friday, April 28

Each exam will concentrate on material covered since the previous exam. The **Final Exam** will be given on **Wednesday, May 10 (10 am to 12 pm)**, and will be comprehensive covering all the material discussed during the semester. The Final Exam will count 150 points.

Missed Homework and Exams – In most cases, no points or make-up exams will be given for homework more than 3 class periods late or missed exams. Institutional excuses and documented illnesses will be considered on an individual basis.

Grading Scale -	Homework (normalized)	100 pts
	Exams (3 @ 100 pts each)	300 pt
	Final Exam	<u>150 pts</u>
	Total Points Possible	550 pts

A > 90%

B 90% to 80%

C 79% to 70%

D 69% to 50%

F < 50%

Texts & Calculator:

Quantitative Chemical Analysis, 6th Edition, Daniel C. Harris, 2003, W. H. Freeman and Company, New York.

Solutions Manual for Quantitative Analysis, 6th Edition, Daniel C. Harris, 2003, W. H. Freeman and Company, New York

You will need a “scientific calculator” ($\ln x$, e^x , $\log x$, 10^x) for the homework and exams.

Reading: You will be held accountable for the reading assignments (text, specific literature, etc.).

Important Dates:

February 24

Week of March 20 - 27

March 17

April 28

May 10

First Exam

Spring Break + 1 (no classes)

Second Exam

Third Exam

Final Exam (10 am to 12 pm)

Chapter 0: The Analytical Process

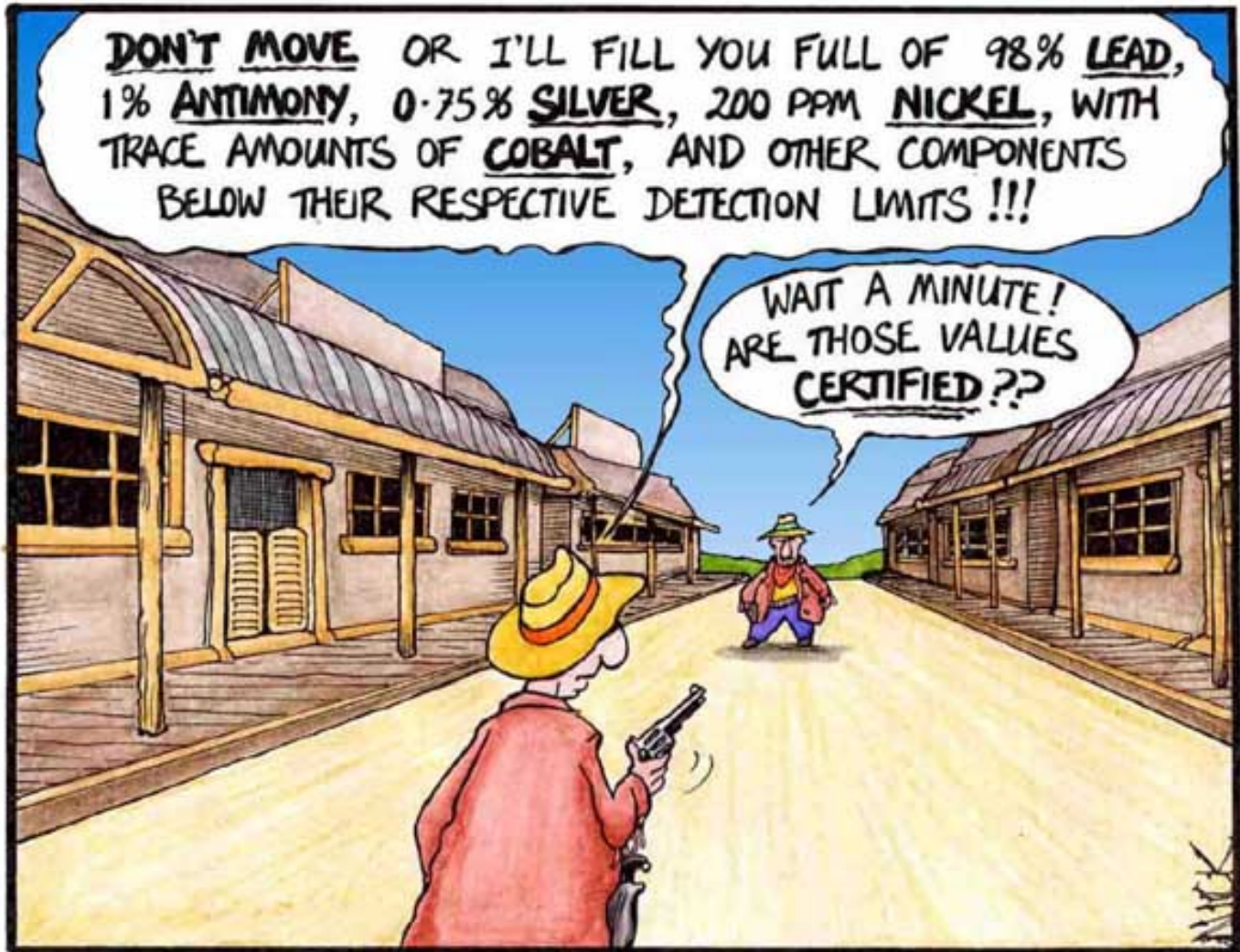
How important is Analytical Chemistry?

- Provides the data needed to answer questions and test hypotheses.
- Utilized by many scientific and engineering disciplines
- A large part of what any chemist (and other scientists) does as part of their job.

STRANGE MATTER

strange-matter.com

by nick d. kim



ANALYTICAL CHEMISTS IN THE WILD WEST

Definitions

- Sampling
- Homogeneous
- Heterogeneous
- Qualitative
- Quantitative
- Sample preparation
- Calibration curve
- Standards
- Species
- Analyte
- Interference
- Masking

General Steps in a Chemical Analysis

Formulate the question or hypothesis

- Select the analytical procedures
- Sampling
- Sample Preparation
- Analysis
- Reporting and interpreting data
- Draw conclusions

20 Questions For Planning Analysis

Is measurement information required for one component or several?

Is the desired information qualitative or quantitative?

Is detailed speciation necessary, i.e. is the oxidation state or the complexed state of a given analyte essential?

What are the expected analyte concentrations?

What degree of precision is required?

What degree of accuracy is required?

What is the physical state of the samples, i.e. gas, liquid or solid?

What is the sample matrix and which of these matrix components are likely to act as interferences? The answer to the latter part of this question will define the required selectivity?

What is the total number of samples to be analyzed and how many sample analyses will be required per month, day, hour, etc.?

Economics, i.e. how much money is available for the necessary equipment and how much can be spent per analysis?

When are the data required and how much time can be spent on method development?

How much sample will be available for each determination?

What sample handling and preparation steps are necessary?

Are the sampling efficiencies known where overall efficiency = collection efficiency x recovery efficiency?

Is the analysis to be performed in the laboratory or at a field site?

Is continuous, unattended monitoring desirable? If so, what degree of equipment reliability, response stability and automation are required?

What is the level of analytical expertise of the people who will actually performing the laboratory work?

Are high purity reference standards available?

What safety practices are required, e.g. do radioactive, extremely poisonous, or carcinogenic reagents pose a safety risk?

What is the desired form of data output, i.e. analog strip chart recordings, digital printouts, floppy disk storage, internet, etc.