

General Chemistry I

Chemistry 112

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Agenda Day 1

- Roll Call
- Announcements
- Syllabus
- Questionnaire
- Course Introduction
- Begin Chapter 1

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Syllabus

- Office hours
 - Much information on web page
 - Tests and Grading - same grade for lecture/lab
- | | |
|------------------------------|-----------|
| -3 Exams 100 points each | 300 |
| -Quizzes/problem sets | 100 |
| -Final Exam | 150 |
| -TOTAL | 550 (2/3) |
| -13 Lab reports at 20 points | 260 (1/3) |
- Approximate grading scale: 90-80-70-60

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What Are the Lectures Like?

PowerPoint slides- slides vs. listening, Listen.
If you get behind taking notes, jot down the slide number in yellow in the upper-left corner. All slides will be on the web.
Pay particular attention to things in yellow.
Most material covered both in the book and in lecture.

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What Are the Exams Like?

Old copies on web site.
What material?

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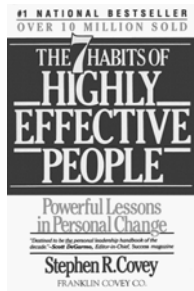
How to Do Well in Chemistry

Begin with the end in mind

Especially in the beginning, work hard on vocabulary

Work lots of problems

Must work outside of class





Introduction to Chemistry

¹
The Nature of Science and Chemistry

Science- study of our environment, trying to understand how and why things work, using logic and experimentation.

Chemistry- study of the structure, properties and changes of *matter*.

Matter- anything that has mass and occupies space.

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Hypotheses, Theories and Laws

Hypothesis- "Educated Guess" concerning how or why a phenomenon occurs.

Theory- A hypothesis becomes theory by becoming "widely" accepted because of testing. It is a proposed explanation for how or why something happens and generally cannot be proven.

Law- A law is a universally accepted explanation of what happens.

Data- recorded observations from experiments

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States of Matter

- Solid- has definite shape and volume
- Liquid- definite volume, no definite shape
- Gas- indefinite volume, no fixed shape

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Classifying Matter

Heterogeneous- samples will not be equivalent (appearance, composition, and properties).

Homogenous- each sample will be equivalent.

Mixture- can be separated into two or more pure substances.

Solution- uniform mixture of pure substances.

Pure substance- uniform and fixed composition.

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Matter from Simple to Complicated

Atom- The smallest particle of an *element*, composed of protons, neutrons and electrons.

Element- A pure substance composed of only one type of atom.

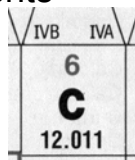
Compound (AKA *molecule*)- A pure substance composed of more than one element.

Mixture of compounds

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About 100 Elements

H
He
Unh



NaCl **NOT** NACL- this is so we can clearly indicate what a molecule is made up of.

EX: CONI

carbon oxygen nitrogen iodine (CONI)
cobalt nickel (CoNi)

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Chemical Formulas Are Used to Show How Elements Form Compounds

Molecular formulas do not show bonds
subscripts denote number of atoms, e.g. C₅H₁₂
superscripts denote charge, e.g. Ca²⁺, Cl⁻

Structural formulas show *chemical bonds* as (single) lines

EX: (very large structure)

Condensed formulas- for large molecules, helps to show atoms in relation to each other

EX: CH₃CH₂CH₂CH₂CH₃

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Physical and Chemical Properties

Physical properties include solubility, color, melting point, odor, hardness, density, taste and state.

Chemical properties more complicated: what does a type of matter react with?

EX: does paper react with air?

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Physical and Chemical Changes

Physical change- A change in matter which does not alter the chemical properties of the matter.

Chemical change- a rearrangement of matter which results in a change of physical properties.

EX: does paper react with air?

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Summary of Matter

