

Chemistry 111

General Chemistry

Introduction—Tools of Chemistry

These notes represent an outline of the initial lectures in General Chemistry I (Chemistry 111). The material is covered in Chapter 1 of *Chemistry & Chemical Reactivity*, 4th edition. These notes will provide a guide for studying the chapter and will help you follow along in the lecture.

End-of-Chapter Questions

Chapter 1—pages 51-57: Questions 4, 6, 8, 10, 12, 14, 16, 22, 26, 28, 30, 36, 50, 52, 54, 60, 64, 72. Using the CD-ROM, answer questions regarding Screens 1.3, 1.6, 1.8, and 1.12.

Note that the questions with boldfaced numbers have answers given in the back of the book (Appendix O, pages A-61 to A-62).

Chemistry 111 Web Site

<http://www.oneonta.edu/~kotzjc/GenChem.html>

Available on this web site are the following materials that may help you better learn the concepts in this course:

- These lecture notes
- A bank of multiple choice questions
- The PowerPoint slides used in the lecture

All of these items can be viewed in Netscape or Microsoft Internet Explorer. In addition, you will need to have *Acrobat Reader* loaded on your computer. Download it from the SUNY-Oneonta Download page

<http://www.oneonta.edu/ocs/documentation/software/download/index.html>

or directly from Adobe:

<http://www.adobe.com/prodindex/acrobat/readstep.html>

Note that some of these Acrobat files are quite large and can only be downloaded conveniently if you have an Internet connection on campus (not a modem connection).

Useful Internet Material

1. The periodic table

Web Elements: <http://www.webelements.com/>

The Comic Book Periodic Table: <http://www.uky.edu/~holler/periodic/periodic.html>

2. Biography of Celsius

http://www.astro.uu.se/history/Celsius_eng.html

3. Origin of Celsius thermometer

<http://users.bart.nl/~sante/engtemp.html>


Introduction—Tools of Chemistry

Chemistry & Chemical Reactivity, 4th edition, Chapter 1

The Language of Chemistry
• CHEMICAL ELEMENTS •



Sodium



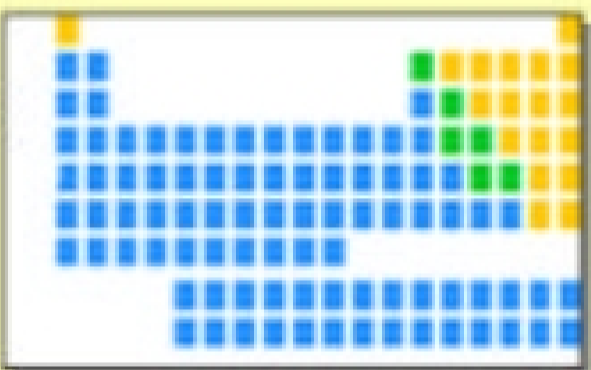
Aluminum Bromine

How do you define a chemical element?

Can you name other chemical elements?

• The elements, their names, and symbols are given on the _____

• How many elements are there?



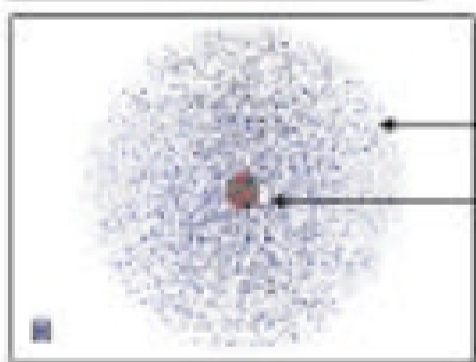
Names and symbols of the elements are given on the _____

How many elements are there? _____

What person is the “father” of the modern periodic table? _____

The Atom

An atom consists of a _____ and _____ in space about the _____



The major components of the atom are:

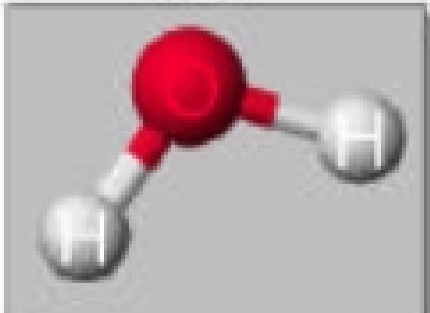
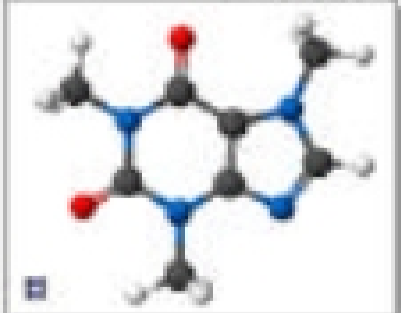
1.

2.

Where is each located?

A **MOLECULE** is the smallest unit of a compound that retains the chemical characteristics of the compound.
 Composition of molecules is given by a **MOLECULAR FORMULA**

H_2O - caffeine

A molecule is

What is a molecular formula?

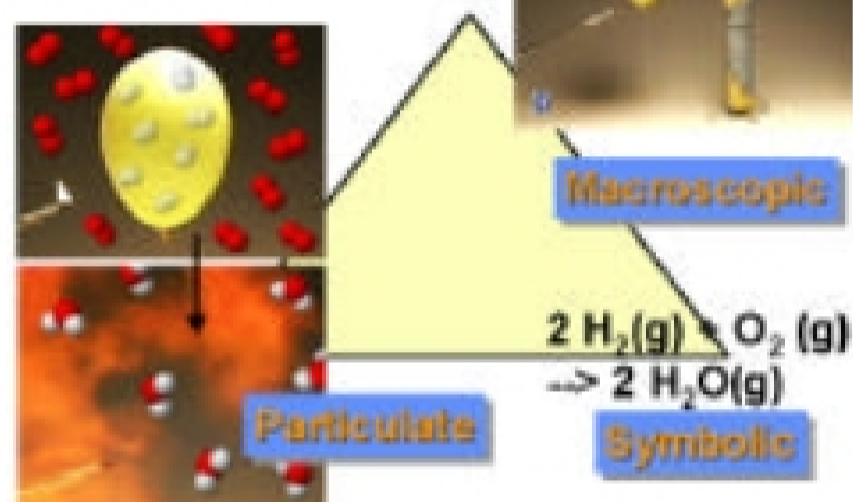
What is the formula of caffeine?

Chemistry & Matter

- We can explore the _____ world
- to understand the _____ worlds we cannot see.
- We write _____ to describe these worlds.

What are the three ways we view chemistry?

A Chemist's View



what happens when we combine the elements hydrogen and oxygen (and a bit of energy)?

STATES OF MATTER

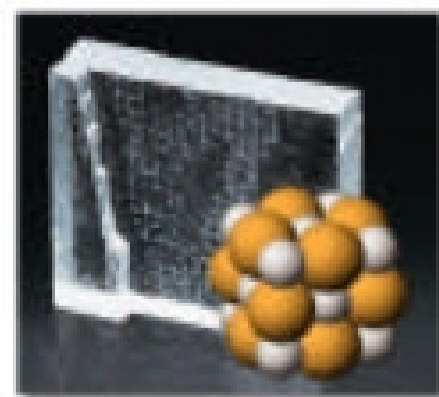
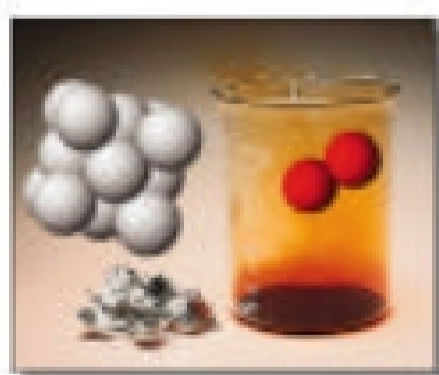
- _____ — have rigid shape, fixed volume. External shape can reflect the atomic and molecular arrangement.
–Reasonably well understood.
- _____ — have no fixed shape and may not fill a container completely.
–Not well understood.
- _____ — expand to fill their container.
–Good theoretical understanding.

What are the three states of matter?

In what state of matter do the molecules move most rapidly?

Physical Properties

What are some physical properties?



Name some physical properties in general?

What are some physical properties of pure water?