C151-L01-W'05

Notes of material discussed or related to matters discussed on day 1.

admin: get roster
get the syllabus out to the lab instructors.√

lecture1

(1) self introduction: GSantillan PS610, MWF 11-12 noon, TR 1:30-2:30 pm,
gsantil@calstatela.edu,
for lecture related material: http://www.calstatela.edu/dept/chem/05winter/151/
call the roll – prerequisite is diagnostic test
For those without the syllabus, show the assignments,

1	Sci method,elements, chem and phys change, metric syst	Check-in, sig figs, unit conversions	Chapt. 1: 1.3.7.15.19.20.21.23,26,33-35,42,51,56,62,67.

2) discuss the syllabus:

3) let's talk about the course: this is not a scary class I don't intend for it to be. It is a class to be useful to you in understanding how chemistry fits into the picture of your field. whether how it affects nutrition, industrial energy use, medical practice.

4) First, we need to understand the way that scientists gain knowledge. SM depends on careful and objective observation. hypothesis. experimentation. theory.

the advance of science is usually traced to the rise of scientific method in europe. As an example, consider the question of where flies come from. People believed that flies came from rotting meat. It took careful observation to deduce that flies came from flies eggs.

example of non scientific method?
superstition.

5) Yet the scientific and technological age that we live in can also cause danger if it is not properly used. To protect ourselves and our society, we need to have an educated population. That is the goal of a college chemistry education.

6) Chemistry = science study of composition, structure and properties of matter and its changes. Usually we deal with the very molecules and atoms making up matter.

atoms = the particles (smallest) associated with matter.
molecules -are particles composed of atoms. electrically neutral.
ion = atom or group of atoms which are electrically charged.
cation= + ion, anion = - ion.
mass = a measure of the quantity of matter in an object or substance

weight = the force exerted by gravity on the mass.

physical property = characteristics such as color, smell, hardness, density
chemical property = describes how it reacts with other substances.

physical change = change which does not entail change in composition. like melting or boiling.

solid = definite volume, mass and shape
liquid = definite vol and mass
gas = def mass.

Substances = elements, compounds or mixtures
elements = atoms are of the same kind
compounds = atoms are 2 or more elements in fixed proportion.

chemical symbol = 1-2 letter symbols used for elements. eg. H = hydrogen, He = helium, try to familiarize yourself with first 20 elements in the periodic table.

(7) Energy = "capacity to do work".
work = many forms but it is based on the concept of force applied to make something move.(mechanical work) - manifests itself in various forms of work: electrical, chemical, in addition.

energy exists in 2 forms: kinetic and potential energy of motion: KE = 1/2 mv^2
PE = potential stored energy

electrical forces = like gravity; unlike charges attrract;

(8) Metric system: the standards of measurement in science. It is very convenient because the units are expressed in multiples of 10.

(International System) SI Units: m, kg, s, K, mol, A, candela

prefixes: 10^{-1} deci, 10^{-2} centi, 10^{-3} milli(m), 10^{-6} micro(u), 10^{-9} nm,

(9) conversion factors: changing from inches to m: 2.54 cm = 1 in, and 100 cm = m

(10) precision and accuracy

(11) sig figs

(12) rules for sig figs in calculations : add, subtract, multiply, divided.

The rules for addition: eg. 2.1 +.235 = 2.335 but we drop the last 2 so: 2.3
Same rule for subtraction.

Rule for multiplication: 2.30 x 1.0 = 2.3 (2 sig figs) same rule in division.

(13 density: represents the amount of mass within a give volume.

In units of kg/m^3 but in chemistry, it is usu. g/cm^3. or g/mL^3 for liquids.
Give examples of how to calculate it. And how to use it as a conversion factor.

(14) temperature:
converting from one (°c) to another (°F) or (K).

it is easiest to convert from F to C or from C to F.

F = C(1.8) + 32. or, C = (F-32)/1.8; K = C+273.15