

Chem 101 Lecture 2b

ppil

UNIVERSITY FURLOUGH ON FRIDAY. HOLIDAY ON MONDAY.

Online homework #1 due 15 Jan. Textbook homework due at recitation.

For recitation : Math review. Use significant figures. Scientific notation.

Rei

Make sure you are registered online for OWL.

(0). Last time:

isotopes

the mole and Avogadro's number

molar weight

conversions between # atoms, moles and mass

molecular formulas (chapt 3)

Today

0) Review Periodic table

1) Molecular formulas

2) Naming binary inorganic compounds

3) Naming hydrocarbons: alkanes

4) line notation of hydrocarbons

0) Periodic table:

Know the names of the groups.

Know the metal, semi metal and non metal regions

Know the names and symbols of the first 20 elements

+ commonly encountered: Ag, Au, Fe, Hg, Sn, Cu,

<p>Discussion of the periodic table The various groups Their properties Periodic table. Look at their properties.</p> <p>The columns are the "groups".</p> <p>The rows are the "periods".</p> <p>All elements within the same row tend to have very similar chemical properties.</p> <p>By chemical properties we refer to their "reactivities". -distinguish between metals, metalloids and non metals. The metals are good conductors of heat electricity are ductile (can be draw into wire),</p>	<p>malleable (can pressed into sheets), shiny (hus lustre) , solid at room temp (except Hg and H).</p> <p>What % of the elements are <u>non metals</u>? less than 20%. They cluster around the upper right hand corner of the periodic table.</p> <p>- metalloids are found in the "boundary regions": B, Si, Ge, As(arsenic), Sb(antimony), Te,(tellurium)..</p> <p>- Know the basic properties of alkali metals , (AX: A = alkali, X = halogen) eg NaCl alkaline earth metals, (AX₂: A = alkali, X = halogen) eg CaCl₂ halogens, X₂, eg Cl₂ noble gases. X , eg Ne, Ar</p>
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1) there are 2 kinds of compounds:
ionic(crystalline) and covalent
(molecular).

ionic compounds = electrons
completely transferred from 1
element to another.

eg. NaCl: $\text{Na} + \text{Cl} \rightarrow \text{NaCl}$

we'll concentrate on **molecular**

first:

discuss: ethanol. show structural,
condensed and molecular formulas
of ethanol.

Molecules are represented by formulas:

different formulas: molecular formulas, condensed formulas
structural formulas, ball stick model, spacefilling models

2) Nomenclature: Naming covalent (molecular) compounds:

a) binary compounds:

first element retains its name, the second ends with -ide. we use prefix. eg. mono,
di, tri, tetra, penta, hexa, hepta, octa, nona. deca

naming binary inorganic compounds.



b) carbon based: alkanes, alkenes and alkynes contain C and H.

alkanes: 3) hydrocarbons:

(ALKANES)

the first 10 alkane carbons and how
they are named.

overall formula: $\text{C}_n\text{H}_{2n+2}$ for
noncyclic alkanes. C_nH_{2n} for
cycloalkanes

methane	CH_4
ethane	C_2H_6
propane	C_3H_8
butane	C_4H_{10}
pentane	C_5H_{12}

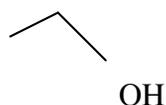
hexane
heptane
octane
nonane
decane

LINE STRUCTURES

Line structures: useful for more complex carbon containing molecules: organic compounds.

eg. ethanol $\text{CH}_3\text{-CH}_2\text{OH}$

how to draw it: a) C have 4 bonds. C occupies corners or ends of the line. C-H is not shown. Others are shown. C bonds are usually bent.



try: C_2Cl_2

OH containing are called alcohols. "ol" is added.

eg. methane becomes methanol

ethane becomes ethanol.

Cycloalkanes are *ringed* structures:

Cyclopentane: C_5H_{10}

Properties of hydrocarbons:

*nonpolar, hydrophobic, oily,
immiscible in water. Lipid and fat
molecules are hydrocarbon-
rich. Usually floats on water.*

The chem formulas are: $\text{C}_n\text{H}_{2n+2}$ for alkanes.

isomers are possible: butane can be isobutane or n-butane