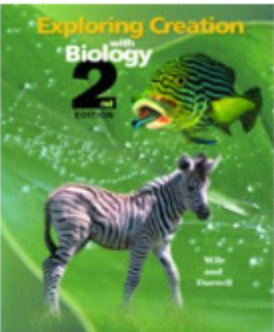


M05 L1 A Wee Bit O Chemistry

Thursday, March 05, 2009
11:28 AM

20 to 30 minutes live time

VoiceThread	http://voicethread.com/share/211812/
Cmap	http://cmapspublic2.ihmc.us/rid=1162255504437_1407680531_16462/00%20The%20Molecules%20of%20Cells.cmap And take the links for Chemistry Basics

Slides	Notes
 <h2>Module 05: Chemistry of Life</h2> <p>👉 Lecture 1: A Wee Bit of Chemistry</p> <p>Lecture 2: Diffusion and Osmosis; Carbohydrates</p> <p>Lecture 3: Lipids and Proteins</p> <p>Lab Day</p> <p>Interactive Practice</p>	<p>2011/12 school year - welcome Kaitlyn Pasile, Luke Hurst, DeKorte, Zachary Volardi, Cassie and Cayla Martin, and Milan Johnson to the class. They are all new students</p>
<p>👉 Elements and Atoms</p> <p>Molecules</p> <p>Chemical Change</p>	

Elements

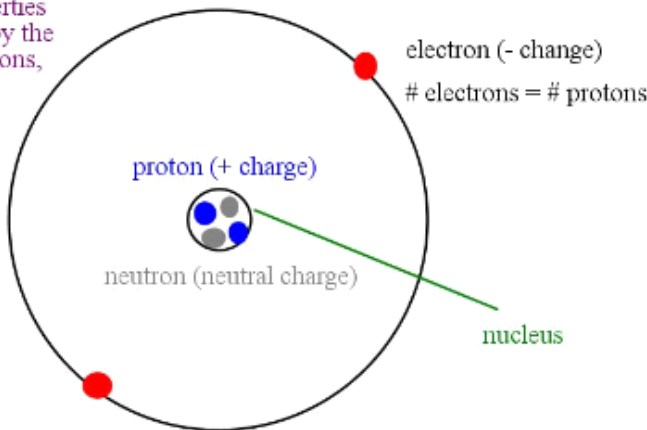
Elements are ...

All atoms that contain the same number of protons.

chemistry book definition ...

Any substance that cannot be decomposed into less massive substances.

The atoms properties are determined by the number of electrons, protons, and neutrons. The most significant one being the electron.



Bohr (planetary) Model of the atom is a bit outdated, but more easily understood than Quantum Mechanics which needs several years more mathematics than calculus to understand.

Electrons sets most of the characteristics.

Electrons = protons
Except for ions, but we will not get in to those here in biology.

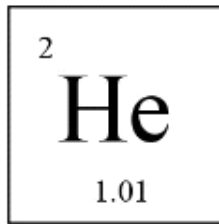
→ How many protons; How many electrons

1 H 1.01																	2 He 4.0
3 Li 6.94	4 Be 9.01											5 B 10.8	6 C 12.0	7 N 14.0	8 O 16.0	9 F 19.0	10 Ne 20.2
11 Na 22.9	12 Mg 24.3											13 Al 27.0	14 Si 28.1	15 P 31.0	16 S 32.1	17 Cl 35.5	18 Ar 39.9
19 K 39.1	20 Ca 40.1	21 Sc 45.0	22 Ti 47.9	23 V 50.9	24 Cr 52.0	25 Mn 54.9	26 Fe 55.8	27 Co 58.9	28 Ni 58.7	29 Cu 63.5	30 Zn 65.4	31 Ga 69.7	32 Ge 72.6	33 As 74.9	34 Se 79.0	35 Br 79.9	36 Kr 83.6
37 Rb 85.5	38 Sr 87.6	39 Y 88.9	40 Zr 91.2	41 Nb 92.9	42 Mo 95.9	43 Tc 98.9	44 Ru 101.1	45 Rh 101.9	46 Pd 106.4	47 Ag 107.9	48 Cd 112.4	49 In 114.8	50 Sn 118.7	51 Sb 121.8	52 Te 127.6	53 I 126.9	54 Xe 131.3
55 Cs 132.9	56 Ba 137.3	57 La 138.9	58 Ce 140.9	59 Pr 140.9	60 Nd 144.2	61 Pm 145.0	62 Sm 150.4	63 Eu 152.0	64 Gd 157.3	65 Tb 158.9	66 Dy 162.5	67 Ho 164.9	68 Er 167.3	69 Tm 168.9	70 Yb 173.0	71 Lu 175.0	
87 Fr 223	88 Ra 226	89 Ac 227	90 Th 232	91 Pa 231	92 U 238	93 Np 237	94 Pu 244	95 Am 243	96 Cm 247	97 Bk 247	98 Cf 251	99 Es 252	100 Fm 257	101 Md 288	102 No 289	103 Lr 260	

72 Ce 140.1	73 Pr 140.9	74 Nd 144.2	75 Pm 145.0	76 Sm 150.4	77 Eu 152.0	78 Gd 157.3	79 Tb 158.9	80 Dy 162.5	81 Ho 164.9	82 Er 167.3	83 Tm 168.9	84 Yb 173.0	85 Lu 175.0
90 Th 232.0	91 Pa 231.0	92 U 238.0	93 Np 237.0	94 Pu 244.0	95 Am 243.0	96 Cm 247.0	97 Bk 247.0	98 Cf 251.0	99 Es 252.0	100 Fm 257.0	101 Md 288.0	102 No 289.0	103 Lr 260.0

The number of protons will determine what the element is

Protons are important because that tells what the element is.

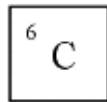


One element but three kinds of atoms

- 2 protons, 2 electrons, 1 neutron He-3
 - 2 protons, 2 electrons, 2 neutrons He-4
 - 2 protons, 2 electrons, 3 neutrons He-5
- } protons + neutrons

all are called helium based on the number of protons they contains

Though neutrons vary. We go by protons for naming.



Give the number of

protons electrons neutrons

C-13

--	--	--

P:6
 E: 6
 N = 6 + ___ = 13: 7

Elements and Atoms

👉 Molecules

Chemical Change

Compounds

~~Molecules~~
~~Compounds~~ are ..

Substances that can be decomposed into elements.

Interchangeable terms

You get something totally new when you mix and match those elements.

C

O

CO

CO₂

C carbon
O oxygen

Characteristics of each, then compare to ...

CO Carbon monoxide

Then compare to ...

CO₂

Identify the following as either an atom, element, or molecule.



NH₃



O



carbon-14




S





H₂

How many of each atom exists in the following molecules?

Capital letters help you to spot where the element starts and stops.

a. $KMnO_4$ answer: 

b. Na_3PO_4 answer: 

c. $RbCl$ answer: 

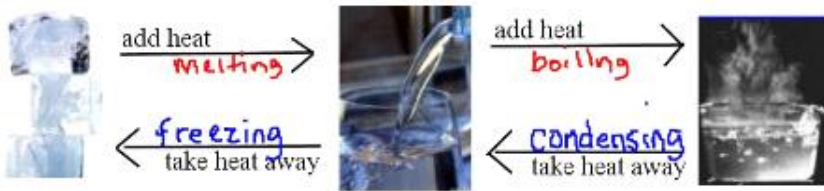
Elements and Atoms Molecules

👉 **Chemical Change**

Physical Change

Phase changes are physical changes.

3 phase changes: solid, liquid, gas



Sublimation: goes straight from a solid to gas

Chemical Change



Reactions:
color change
temperature change
scent

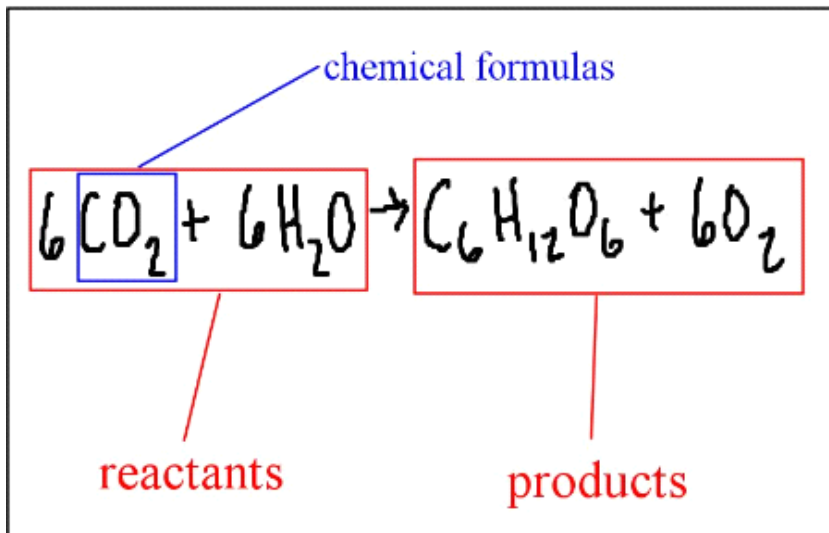
This lab will explore a chemical change. We will cover that more in detail on lab day. Has anyone ever done this lab?

Classify the following changes as physical or chemical.

- a. Steam condensing in to water
- b. Gasoline burns in an automobile engine.
- c. A barber cuts your hair.
- d. Milk sours
- e. Sugar is dissolved in water.
- f. Milk is poured into cereal.
- g. An iron nail rusts.

- a. [REDACTED]
- b. [REDACTED]
- c. [REDACTED]
- d. [REDACTED]
- e. [REDACTED]
- f. [REDACTED]
- g. [REDACTED]

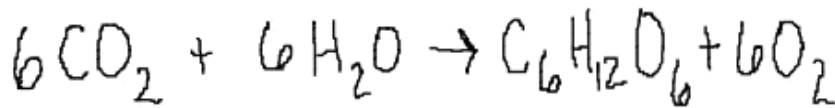
Chemical Equation



What is a chemical equation vs a chemical formula.

What is reactants vs products

Photosynthesis



catalyst

a substance that speeds up a reaction but does not get used up in the process.

The catalysts can be chlorophyll and/or phycobilin

glucose

This is a very important reaction. It is photosynthesis. There is a catalyst involved called chlorophyll. Notice that it isn't included in the chemical equation. Catalysts don't actually enter in to the reaction in a chemical way. It just helped the molecule and atoms get close enough to bond or is able to break the bonds between the atoms and molecules.

8am: <http://www.virtualhomeschoolgroup.com/mod/quiz/view.php?id=816>

9am: <http://www.virtualhomeschoolgroup.com/mod/quiz/view.php?id=10887>

2:30: <http://www.virtualhomeschoolgroup.com/mod/quiz/view.php?id=13893>

2011/12: <http://www.virtualhomeschoolgroup.com/mod/quiz/view.php?id=18272>