8/29/18

Matter? Anything with mass + volume.

ex:

papes	apples	baking soda
elephants	wate	aluminum
people	salt	dust
tea	helium	5¢ piece
chips	beer	magnesium

Physical State

(s) solids : hard to compress, fixed shape
(l) liquids : " — " —— ", fluid shape
(g) gases : easy " —— ", " ——"

Elements : can't be separated into simpler substances. helium, aluminum magnesium

Compounds - can be separated into elements w/ water, salt, baking soda fixed proportions.

Mixture - can be separated into elements w/ variable ratios paper, elephants people, tea, beer, dust, 5¢ piece

Homogeneous
same composition throughout
ex tea, beer

Heterogeneous
varies in composition throughout
elephants, dust, people.

We classify matter's properties (for ID purposes) as either:

i) Physical (results in no change of substance's composition)

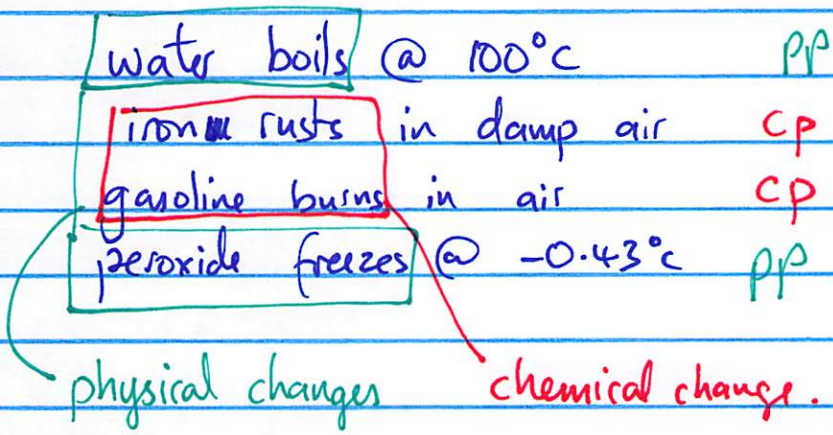
ii) Chemical (does result in change " ——— ")

ex: water boils @ 100°C pp

ex: iron rusts in damp air cp

ex: gasoline burns in air cp

ex: peroxide freezes @ -0.43°C pp



sec 1-5 ... Energy → Read this

1-6 When we measure something, often get 2 pieces of info:

- Unit

ex: 12-Kg, 1.5m, 62-s

unit.

1999, NASA, $125M Mars Climate Orbiter.

2 groups of engineers: were using diff't units.

1 lb, 454 g

'English' unit of mass

'metric' unit of mass.

International System (SI) units ~ used by scientists.

Quantity	Unit	Symbol	
length	meter	m	v. important in CHEM1141
mass	Kilogram	Kg	
time	second	s	
temperature.	Kelvin.	K	
amount of substance	mole	mol	
elec. current.	Ampère	A	
luminous intensity	Candela	cd	

SI prefixes are used to modify our base SI units : larger or smaller.

Prefix	Symbol	Multiplies
tera	T	$\times 10^{12}$
giga	G	$\times 10^{9}$
mega	M	$\times 10^{6}$
Kilo	K	$\times 10^{3}$
deci	d	$\times 10^{-1}$
centi	c	$\times 10^{-2}$
milli	m	$\times 10^{-3}$
micro	μ	$\times 10^{-6}$
nano	n	$\times 10^{-9}$
pico	p	$\times 10^{-12}$