

The slide features a solid blue background. On the left and right sides, there are decorative geometric patterns composed of overlapping chevron and parallelogram shapes in yellow, magenta, and light blue. The text "Chemistry Review" is centered in the upper half of the slide.

Chemistry Review

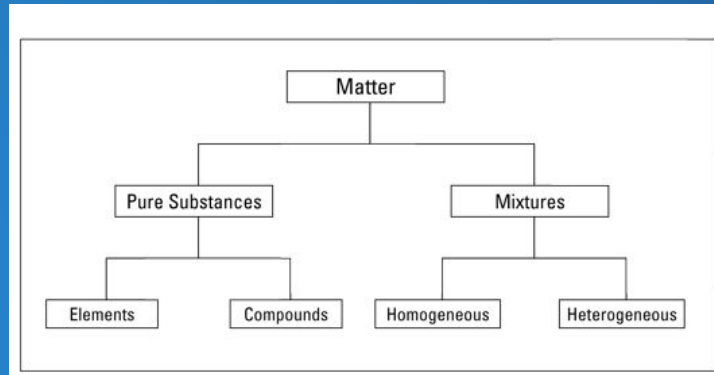
Chemistry

- Chemistry is the study of matter
- WHMIS - Workplace Hazardous Material Information System
- Know the 8 symbols



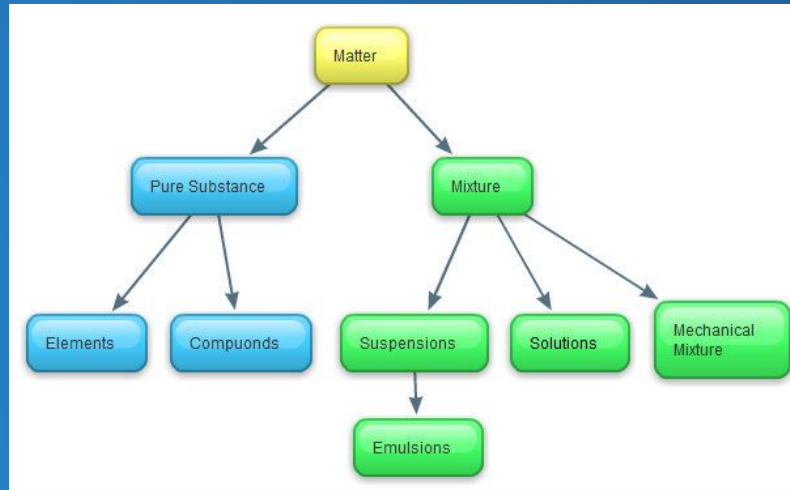
Particle Model of Matter

- Matter is classified into solids, liquids and gases based on particle distance and bonding
- Matter can be further classified into pure substances and mixtures
- Elements and compounds are both pure substances



Mixtures

- Mixtures can be heterogenous (mechanical mixtures) or homogenous (solutions)
- Heterogenous includes ordinary mechanical mixtures, colloids (and emulsions), and suspensions



Changes

- Chemical reactions must create a new substance
- If a new substance is not created then the matter went through a physical change

Chemical Changes

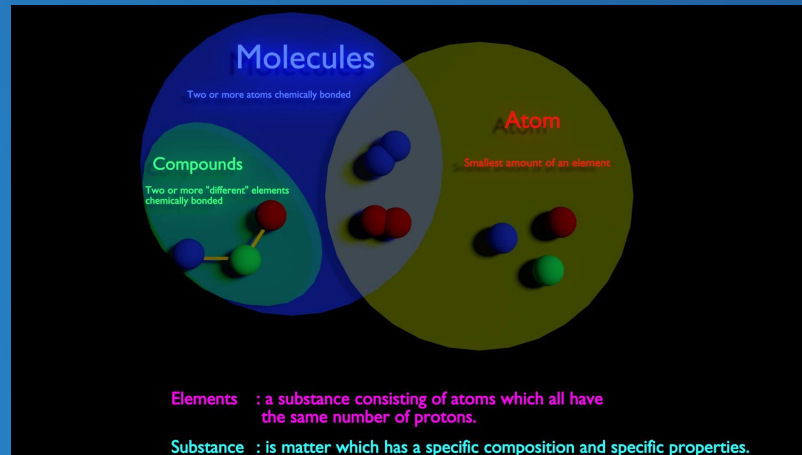
- **Signs that indicate a chemical change:**
 - color change,
 - odor change,
 - production of thermal energy (heat),
 - production of cold,
 - fizzing,
 - foaming,
 - bubbling
 - Sound produced,
 - light being given off
 - Precipitate formed (solid)
 - Oxidation (rust, tarnishing)

2 Laws

- Law of Conservation of Matter states that in a chemical reaction all mass is preserved - mass of reactants = mass of products
- Law of Definite Composition states that compounds are always put together in a specific way - Water is ALWAYS H₂O

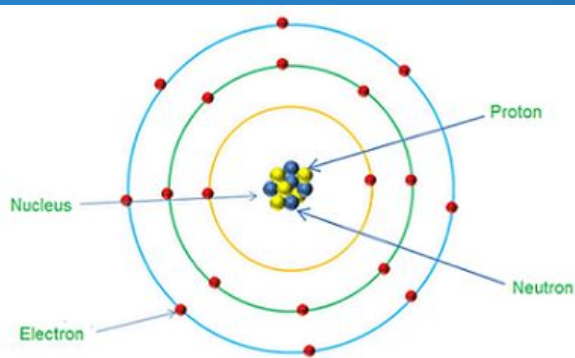
Pure Substances

- Compounds are made of at least 2 different elements
- Elements can bond with themselves to create diatomic molecules
- Molecules are at least 1 element bonded to another element



Atoms

- Atoms are made up of protons(+), electrons (-), and neutrons
- Protons and neutrons are found in the nucleus - very heavy
- Electrons are found outside the nucleus - very light



Periodic Table

- Elements are arranged on the periodic table according to their number of protons
- The table is split into metal, metalloids, and non metals
- Atomic number, symbol, atomic mass

Periodic Table of Elements

For elements with no stable isotopes, the mass number of the isotope with the longest half-life is in parentheses.

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number of neutrons = atomic mass - atomic number

5
B
boron
10.811

Atomic number — The number of protons in the nucleus of the atom.

Atomic mass — The average mass of the atoms in an element.

Element name — Usually from a Greek or Latin word for the element or a substance containing the element.

Symbol — Short-hand abbreviation for the element name.

CARBON
6
C
12.01

Chemical Families

- Alkali metals - very reactive, first column, one extra electron
- Alkaline Earth Metals - reactive, 2nd column, two extra electrons
- Halogens - very reactive, 2nd last column, short 1 electron
- Noble gases - inert, last column, full electron shell

Alkali Metals										Alkaline Earth Metals										Transition Metals										Noble Gases																																																																							
H	He	Li	Be	B	C	N	O	F	Ne	Na	Mg	Al	Si	P	S	Cl	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	Ba	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn	Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

Families of the periodic table.
CC - Trace Poulton

Compounds

- Metals and non metals may bond together, transferring electrons to create ionic compounds
- Non metals and non metals may bond, sharing electrons to create molecular compounds

Properties of Compounds

Ionic	Molecular
<ul style="list-style-type: none">• Stable• Soluble in water• Conduct electricity in water• Made up of one metal and one non-metal	<ul style="list-style-type: none">• Don't conduct electricity• Made up of two non-metals• Low melting and boiling points• Most don't dissolve well in water

Naming compounds

- Ionic - Metal first then non metal with -ide ending
- Molecular - first non metal has numerical prefix (but never mono), second non metal has numerical prefix and -ide ending

Number	Prefix
1	mono-
2	di-
3	tri-
4	tetra-
5	penta-
6	hexa-
7	hepta-
8	octa-
9	nona-
10	deca-

Formula	Name	Formula	Name
CO	Carbon monoxide	CCl ₄	Carbon tetrachloride
CO ₂	Carbon dioxide	PCl ₅	Phosphorus pentachloride
NO ₂	Nitrogen dioxide	SF ₆	Sulphur hexafluoride
SO ₂	Sulphur dioxide	N ₂ O ₄	Dinitrogen tetroxide
SO ₃	Sulphur trioxide	N ₂ O	Dinitrogen oxide
PCl ₃	Phosphorus trichloride	N ₂ O ₅	Dinitrogen pentoxide

Chemical Reactions

- Catalysts speed up chemical reactions but are not used in the reaction
- Inhibitors slow down chemical reactions but are not used in the reaction
- Rust is formed through oxidation
- Combustion is the burning of carbon molecules in the presence of oxygen
- Electroplating can slow down rusting