

Matter

Pure Substances

have 1 type of substance

Elements

have 1 type of atom

118 elements

- 92 occur naturally

Ex) oxygen, O
beryllium, Be
gold, Au
arsenic, As

cannot be broken down by chemical or physical changes

Compound

2 or more atoms chemically bonded together

Ex) salt NaCl
water H₂O
carbon dioxide CO₂

can be broken down by chemical charges

Mixtures

a physical blend of 2 or more substances

Heterogeneous mixture

not uniform
(you can see each component)

Ex) trail mix
oil & water
cheeseburger
dirt

Homogeneous mixture

Solutions

uniform
(you cannot see each component)

Ex) koolaid
milk
lemonade
air
bronze (Cu & Zn)

can be separated by physical changes

Bonding

why do elements bond? **to become STABLE**

OCTET RULE

Elements bond in order to obtain a total of 8 valence e⁻ (except H & He, need only 2 valence e⁻). All elements want to have the same e⁻ configuration as a noble gas.

3 ways elements can bond

- (1) metallic bonding - b/w 2 metals
- (2) ionic bonding - b/w metal & nonmetal
- (3) covalent bonding - b/w 2 nonmetals or metalloids

Metallic Bonds

- occur when valence e⁻ in metals delocalize or free themselves from the atom, & roam throughout the substance as a "sea of e⁻"



Ionic Bonds

- an electrostatic force of attraction that occurs when valence e⁻ are transferred from metals to nonmetals. Forms ions - charged atoms

- Metals lose valence e⁻ to become positively charged ions, called CATIONS



loses 1 valence e⁻

cation : Na⁺

or
Na⁺