

## **Physical Versus Chemical Changes**

### **Matter**

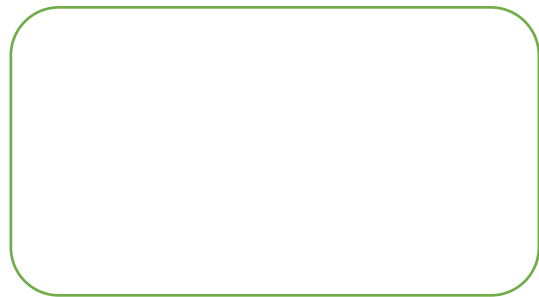
### **Physical Change**

What are the six phase changes?

What really changes during a phase change?

### **Chemical Change**

A Flow chart for Matter:



## **The Language of Chemistry**

Element

Atom

Molecule

Isotope

Compound

Ion

Cation

Anion

Monoatomic

Diatomic

Polyatomic

Organic

Inorganic

Molecular

Covalent

Ionic

Mixture

Solution

## **Solutions**

Solute

Solvent

What does a solution look like at the particle level?

Why does a solute dissolve?

Concentration

**The Periodic Table is your friend**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 H																	2 He
3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	27 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
55 Cs	56 Ba	57 La	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
87 Fr	88 Ra	89 Ac	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og

58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 Lr	103 Hg

Metals vs. Non-metals

Cations vs. Anions

How do we determine charge?

Sometimes we use the term "Valence"

**Formula Writing for Ionic Compounds**

	$\text{Cl}^-$	$\text{O}^{2-}$	$\text{SO}_4^{2-}$	$\text{PO}_4^{3-}$
$\text{H}^+$				
$\text{Mg}^{2+}$				
$\text{Al}^{3+}$				
$\text{NH}_4^+$				

**Chemical Nomenclature**

## Single Metal Ions:



## Transition Metal Ions



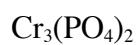
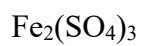
## Single Nonmetal ions



## Binary compounds with main group metals



## Binary compounds with transition metals

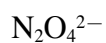
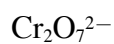
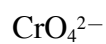




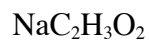
## Names of Polyatomic Ions with Oxygen atoms



## Ions Containing Prefixes



## Binary Compounds with Polyatomic Ions



**Molecular Compounds**

CO

SO<sub>2</sub>NO<sub>2</sub>CO<sub>2</sub>SO<sub>3</sub>N<sub>2</sub>O<sub>5</sub>**Acids***Binary Acids*

HF

HCl

HBr

HI

H<sub>2</sub>S*Oxyacids*

-ate

-ite

H<sub>2</sub>SO<sub>4</sub>H<sub>2</sub>SO<sub>3</sub>HNO<sub>3</sub>HNO<sub>2</sub>**Bases**

NaOH

Mg(OH)<sub>2</sub>

KOH

Ba(OH)<sub>2</sub>

LiOH

Ca(OH)<sub>2</sub>