Review

Valence Electrons: Unpaired electrons in the outter shell that participates in bonding

Lewis Dot Structure: Shows distribution of valence electrons.

Charge

Valence e⁻: 1-4
Charge = Valence

Valence: 5-7
Charge = Valence - 8

Group #:	1	2	13	14	15	16	17	18
Valence electrons:	1	2	3	4	5	6	7	8
Lewis Dot:	Rb	Ba	In	Ge	As	Te	I	Xe

Remember: Each side must have one electron before you pair the electrons together.

Charges: Atom loses or gains electrons to become ion.

Rb^+ Cation: Loss of electrons. Positive charge

I^- Anion: Gain of electrons. Negative charge

Ionic Review

Bond between a metal and non-metal
Metal ion gives up at least one valence e^- to the nonmetal

Charges must have net charge of zero

$1 + (-1) = 0$

$Na^+ + Cl^- = NaCl$

$K^+ + O^{-2} = K_2O$

$1 + (-2) = -1 \times 2$

$2(1) + (-2) = 0$ ✓

Covalent Review

Bond between two nonmetals
Valence e^-'s are shared
Don't have to worry about Charges.
Must meet Octet rule

Formula Review

Ionic

- Metal Cation comes first then nonmetal anion

  metal → NaCl ← nonmetal

- Charge Switches partners and become Subscripts

  K^{+1} O^{-2} → K_2^{2} + O_1^{1} = K_2O

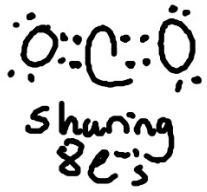
- Subscripts tell us how many of that element is present for a stable compound.

Covalent

- Least electronegative element goes first

  Least electronegative → CO_2 ← more electronegative

- Must reach Octet rule



Naming Review

Ionic
- Cation (metal) gets regular name
- Anion (nonmetal) drop ending add -ide

NaCl

Sodium Chloride

w/ Transition metal (metal in groups 3-12)
- Same as above
- Specify charge of Transition metal with roman numerals in middle

FeO

Iron (II) Oxide

w/ Polyatomic Ion (more than 2 nonmetals attached to a metal)
- Cation gets regular name
- Anion use polyatomic Ion sheet
  Use compound name as written

K_2SO_4

Potassium Sulfate

Naming Review

Coralent

- Use prefixes to show how many of each element.
- First element same name on periodic table
  Only use prefix if more than one.
- Second element drop ending add -ide
  Always use a prefix

Prefixes	
1- mono	6- hex
2- Di	7- hept
3- tri	8- Oct
4- tetra	9- Non
5- Penta	10- Dec

CO_2

Carbon Dioxde

N_2O_4

Dinitrogen Tetraoxide

Mass Percent Review

Tells us how much weight an element Contributes to a Compound

$$\frac{\text{Weight of element}}{\text{Weight of Compound}} \times 100$$

Mass percent of Fe in $FeCl_2$

$FeCl_2$ 70.90

$55.85 + 2(35.45) = 126.75$

$\frac{55.85}{126.75} \times 100 = 44.06\%$

Empirical Formula Review

Using mass percents to find the simplified form of a chemical formula.

Find the empirical formula of a Compound that is 57.14% C, 6.16% H, 9.52% N, 27.18% O

Steps

Change % to grams: C: 57.14g H: 6.16g N: 9.52g O: 27.18g

Change grams to moles: C: $\frac{57.14}{12.01} = 4.75$ H: $\frac{6.16}{1.01} = 6.10$ N: $\frac{9.52}{14.01} = .68$ O: $\frac{27.18}{16.00} = 1.7$

Divide by lowest mole: C: $\frac{4.75}{.68} = 7$ H: $\frac{6.10}{.68} = 9$ N: $\frac{.68}{.68} = 1$ O: $\frac{1.7}{.68} = 2.5$

$C_{7\times2}H_{9\times2}NO_{2.5\times2} = \boxed{C_{14}H_{18}N_2O_5}$

Molecular Formula

$C_{14}H_{18}N_2O_5$ has molecular mass of 294.3 g/mol. Find molecular formula

Steps

Calculate formula mass

$C_{14}H_{18}N_2O_5$

$14(12.01)+18(1.01)+2(14.01)+5(16.00)$

$168.14+18.18+28.02+80$

Divide

$$\frac{\text{molecular weight}}{\text{Empirical weight}} = \frac{294.34\ g}{294.3} = 1$$

Multiply Subscripts

$C_{14\times1}H_{18\times1}N_{2\times1}O_{5\times1} = C_{14}H_{18}N_2O_5$