(1) Percent Error

$$\%\text{ error} = \frac{|\text{actual} - \text{expected}|}{\text{expected}} \times 100\%$$

TIPS – absolute value is indicated by | | = NO SIGNAGE

⇒ can be expressed many ways –

$$\frac{|\text{experimental} - \text{accepted}|}{\text{accepted}}$$

---

(2) Temp Conversions

$$K = C - 273$$

⇒ use algebra to re-arrange

$$T = t - 273$$

---

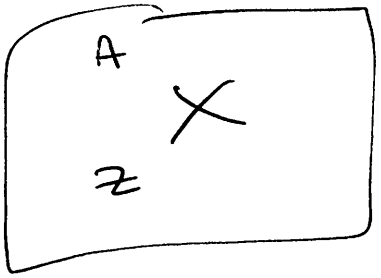
(3) $D = \frac{m}{V}$

$$\text{Density} = \frac{\text{mass}}{\text{volume}}$$

SO... $m = DV$

and... $V = \frac{m}{D}$

(4) Isotope Symbols



A = MASS # (Protons + Neutrons)

Z = Atomic Number (protons)

X = ELEMENT SYMBOL

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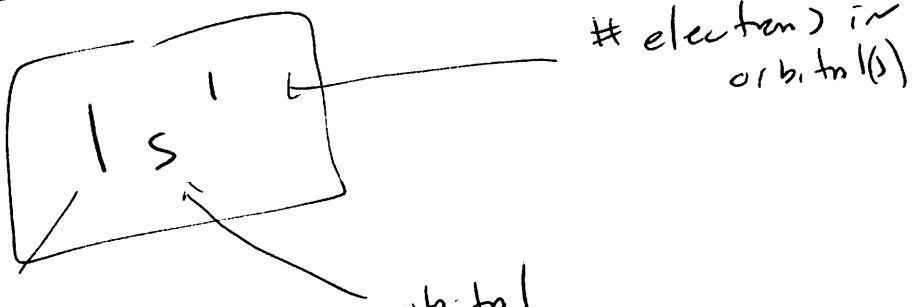
(5) Electron Configuration



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(6)

λ = wavelength (lambda)

ν = frequency (nu)

c = speed of light (3.00×10^8 m/s)

$\lambda\nu = c$ so $\lambda = \frac{c}{\nu}$

and $\nu = \frac{c}{\lambda}$

(7) # Periodic Trends

atomic size decreases → (counter-intuitive)

ionization energy increases →

electronegativity increases →

atomic size increases ↓

electronegativity decreases ↓

(8) # Symbols for Ions

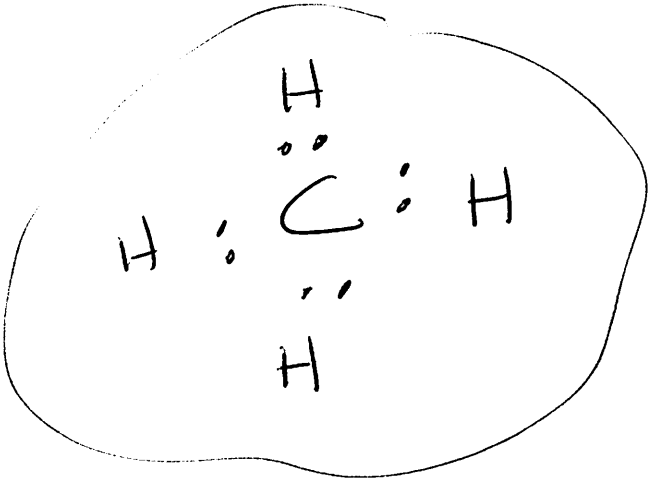
Ca^{2+} O^{2-}

Na^{+} Cl^{-}

(9) Electron Dot Structures

→ use valence electrons

CH_4 ⇒



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(10) Neutralize the charge - (Binary Ionic compounds)

- take the ions in the multiples needed to have charge = ∅

Al^{3+} and Cl^-

- you would need three Cl^- each with −1 charge to neutralize one Al^{3+} with a 3+ charge

$AlCl_3$

(11) Binary Molecular Compounds

✡ Prefixes !!

→ Don't use mono on first element

→ give the second one an -ide ending

N_2O_3 – dinitrogen trioxide

CO – carbon monoxide

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(12) Avogadro's

6.02 $\times 10^{23}$ rep. particles = 1 mole

---

(13) Molar Mass of Compounds

⇒ from Periodic Table

H_2O =

H = 1.01
H = 1.01
O = 16.00
18.02 a

18.0 g/mol

(14) Moles to Mass

$1.50\ mol\ H_2O = ?\ grams$

$1.50\ mol\ H_2O \left(\frac{18.0\ g\ H_2O}{1\ mol\ H_2O}\right) = \boxed{27.0\ g\ H_2O}$

---

(15) Molar Volume of a Gas

$= \boxed{22.4\ L/mol}$

✡ Any gas at STP.

Standard Temp and Pressure

$\boxed{\begin{array}{c} 0^\circ C \\ 1\ atm \end{array}}$

$1.50\ L\ N_2 = ?\ mol\ N_2$

$1.50\ L\ N_2 \left(\frac{1\ mol\ N_2}{22.4\ L\ N_2}\right) = \boxed{0.067\ mol\ N_2}$

(16) Molar Mass from Density.

TRICK – express things as fractions

Density of ? gas = 1.85 g/L express as $\frac{1.85\ g}{L}$ WHAT IS molar mass?

$$\text{molar mass} = \frac{1.85\ g}{1\ L}\left(\frac{22.4\ L}{1\ mol}\right) = 41.4\ g/mol$$

---

(17) Percent Composition from formula

% comp of O in H_2O

O – 16.0 g
H – 1.0 g
H – 1.0 g
18.0 g TOTAL

$\frac{16.0}{18.0} = 0.889$

= 88.9 % O in H_2O