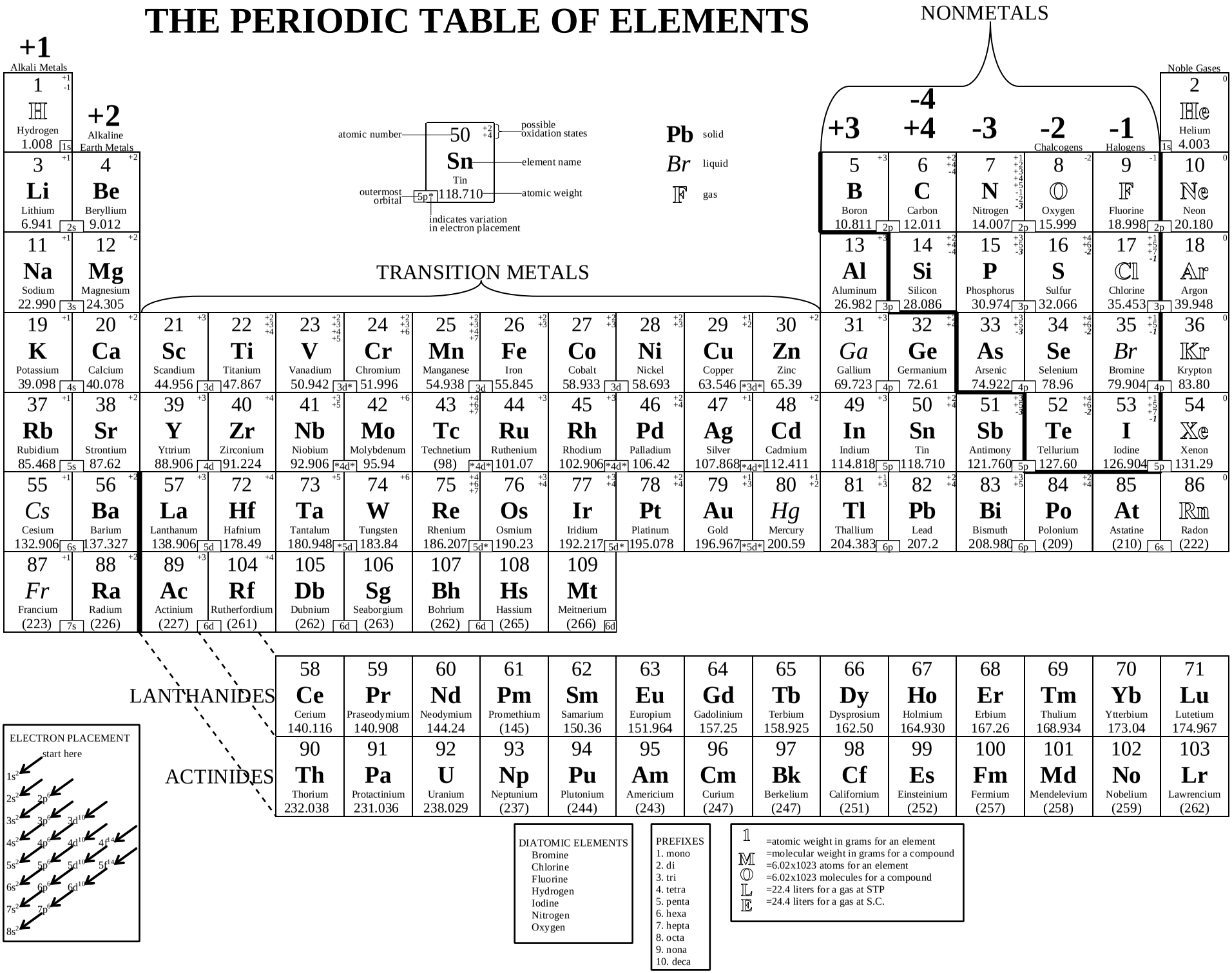
THE PERIODIC TABLE OF ELEMENTS



SOLUBILITY CHART

s = soluble
I = insoluble
- = does not exist
s/I= partly soluble
d= decomposes

	Acetate	Bromide	Carbonate	Chlorate	Chloride	Hydroxide	Iodide	Nitrate	Oxide	Phosphate	Sulfate	Sulfide	
	CH_3COO^-	Br^-	CO_3^{-2}	ClO_3^-	Cl^-	OH^-	I^-	NO_3^-	O^{-2}	PO_4^{-3}	SO_4^{-2}	S^{-2}	
Aluminum	s	s	-	s	s	i	s	s	i	i	-	d	Al^{+3}
Ammonium	s	s	s	s	s	s	s	s	-	s	s	s	NH_4^+
Barium	s	s	i	s	s	s	s	s	s	i	i	s	Ba^{+2}
Cadmium	s	s	i	s	s	i	s	s	i	i	s	i	Cd^{+2}
Calcium	s	s	i	s	s	i	s	s	i	i	i	i	Ca^{+2}
Copper(I) -ous	-	s/i	i	-	i	i	i	-	i	-	d	i	Cu^+
Copper(II) -ic	s	s	d	s	s	i	-	s	i	i	s	i	Cu^{+2}
Hydrogen	s	s	s	s	s	s	s	s	s	s	s	s	H^+
Iron(II) -ous	s	s	i	-	s	i	s	s	i	i	s	i	Fe^{+2}
Iron(III) -ic	i	s	-	-	s	i	-	s	i	i	s/i	i	Fe^{+3}
Lead(II) -ous	s	s/i	i	s	s/i	i	i	s	i	i	i	i	Pb^{+2}
Lead(IV) -ic	d	-	-	-	d	-	-	-	i	-	-	-	Pb^{+4}
Magnesium	s	s	i	s	s	i	s	s	i	i	s	d	Mg^{+2}
Manganese	s	s	i	-	s	i	s	s	i	-	s	i	Mn^{+7}
Mercury(I) -ous	s/i	i	i	s/i	i	-	s/i	s/d	i	i/d	i	i	Hg^+
Mercury(II) -ic	s	s/i	i	s	s	i	i	s	i	s/i	d	i	Hg^{+2}
Nickel	s	s	i	s	s	i	s	s	i	i	s	i	Ni^{+2}
Potassium	s	s	s	s	s	s	s	s	d	s	s	s	K^+
Silver	s	i	i	s	i	-	i	s	i	i	s/i	i	Ag^+
Sodium	s/i	s	s	s	s	s	s	s	d	s	s	s	Na^+
Tin(II) -ous	-	s/d	-	-	s/d	-	s/d	-	i	i	s/d	i	Sn^{+2}
Tin(IV) -ic	s	s	i	s	s	i	s	d	i	i	s	i	Sn^{+4}
Zinc													Zn^{+2}

RULES FOR SIGNIFICANT DIGITS

1. *Digits other than zero are always significant.*
   - 96 g — 2 significant digits
   - 61.4 g — 3 significant digits
   - 0.52 g — 2 significant digits
2. *One or more final zeros used after the decimal point are always significant.*
   - 4.72 km — 3 significant digits
   - 4.7200 km — 5 significant digits
   - 82.0 m — 3 significant digits
3. *Zeros between two other significant digits are always significant.*
   - 5.029 m — 4 significant digits
   - 306 km — 3 significant digits
4. *Zeros used solely for spacing the decimal point are not significant. The zeros are placeholders only.*
   - 7000 g — 1 significant digit
   - 0.00783 kg — 3 significant digits
5. *Counted numbers have an infinite number of significant digits.*
   - 32 people — ∞ significant digits
   - 3 cars — ∞ significant digits

CHEMISTRY STUDY GUIDE

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STEPS TO DIMENSIONAL ANALYSIS

How many seconds are in 76 years?
Unknown: seconds

Given: 76 years
Known Relationships:
60 sec = 1 min
60 min = 1 hr
24 hr = 1 day
365 days = 1 year

76 years → s

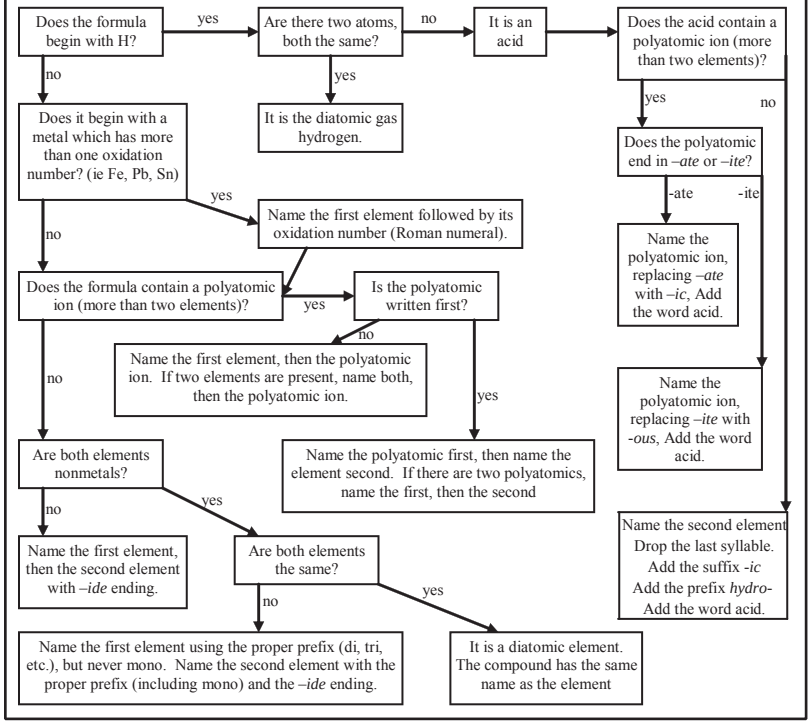
76 years | 365 days / 1 year | 24 hrs / 1 day | 60 min / 1 hr | 60 s / 1 min → s

76 ~~years~~ | 365 ~~days~~ / 1 ~~year~~ | 24 ~~hrs~~ / 1 ~~day~~ | 60 ~~min~~ / 1 ~~hr~~ | 60 s / 1 ~~min~~ → 2,400,000,000 s

76 x 365 x 24 x 60 x 60) / (1 x 1 x 1 x 1) = 2,396,736,000 = 2,400,000,000

1. **Determine Unknown**:
   a. Establish the units you are trying to get by reading the question.
2. **Determine the Given and Known Relationships**:
   a. Write down the information that is given in the problem.
   b. Write down any relationships that might help in the conversion.
3. **Setup Diagram**:
   a. Start with the given.
   b. Place the units you are trying to get at the end of the diagram.
4. **Canceling Units**:
   a. This can be done by making sure the units you are trying to cancel are both on top and bottom.
   b. Keep adding relationships to the dimensional analysis diagram until all units have canceled except the one(s) you are trying to get.
5. **Check the Setup**:
   a. Make sure all unwanted units cancel out.
   b. Make sure all relationships used are correct.
6. **Calculate Results**:
   a. Multiply all values on top and divide by all values on the bottom.
   b. Round to the correct number of significant figures.
   c. Remember definitions have an infinite number of significant figures.

NAMING INORGANIC COMPOUNDS



Go Cougs! Go Tigers!

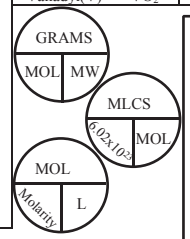
METRIC CONVERSTIONS

Multiplication Factor	Prefix	Symbol
1 000 000 000 000	tera	T
1 000 000 000	giga	G
1 000 000	mega	M
1 000	kilo	k
100	hecto	h
10	deka	da
1		
0.1	deci	d
0.01	centi	c
0.001	milli	m
0.000 001	micro	μ
0.000 000 001	nano	n
0.000 000 000 001	pico	p
0.000 000 000 000 001	femto	f
0.000 000 000 000 000 001	atto	a

Up=Left
Down=Right

NAMES & CHARGES OF POLYATOMIC IONS

1-		2-		3-		4-	
Acetate	$C_2H_3O_2^-$	Carbonate	CO_3^{2-}	Arsenate	AsO_4^{3-}	Hexacyanoferrate(II)	$Fe(CN)_6^{4-}$
Amide	NH_2^-	Chromate	CrO_4^{2-}	Arsenite	AsO_3^{3-}	Orthosilicate	SiO_4^{4-}
Astatate	AtO_3^-	Dichromate	$Cr_2O_7^{2-}$	Borate	BO_3^{3-}	Diphosphate	$P_2O_7^{4-}$
Azide	N_3^-	Hexachloroplatinate	$PtCl_6^{2-}$	Citrate	$C_6H_5O_7^{3-}$		
Benzoate	$C_6H_5COO^-$	Hexafluorosilicate	SiF_6^{2-}	Hexacyanoferrate(III)	$Fe(CN)_6^{3-}$		
Bismuthate	BiO_3^-	Molybdate	MoO_4^{2-}	Phosphate	PO_4^{3-}		
Bromate	BrO_3^-	Oxalate	$C_2O_4^{2-}$	Phosphite	PO_3^{3-}		
Chlorate	ClO_3^-	Peroxide	O_2^{2-}	**1+**		**2+**	
Chl orite	ClO_2^-	Peroxydisulfate	$S_2O_8^{2-}$	Ammonium	NH_4^+	Mercury(I)	Hg_2^{2+}
Cyanide	CN^-			Neptunyl(V)	NpO_2^+	Neptunyl(VI)	NpO_2^{2+}
Formate	$HCOO^-$	Ruthenate	RuO_4^{2-}	Plutonyl(V)	PuO_2^+	Plutonyl(VI)	PuO_2^{2+}
Hydroxide	OH^-	Selenate	SeO_4^{2-}	Uranyl(V)	UO_2^+	Uranyl(VI)	UO_2^{2+}
Hypobromite	BrO^-	Selenite	SeO_3^{2-}	Vanadyl(V)	VO_2^+	Vanadyl(IV)	VO^{2+}
Hypochlorite	ClO^-	Silicate	SiO_3^{2-}				
Hypophosphite	$H_2PO_2^-$	Sulfate	SO_4^{2-}				
Iodate	IO_3^-	Sulfite	SO_3^{2-}				
Nitrate	NO_3^-	Tartrate	$C_4H_4O_6^{2-}$				
Nitrite	NO_2^-	Tellurate	TeO_4^{2-}				
Perbromate	BrO_4^-	Tellurite	TeO_3^{2-}				
Perchlorate	ClO_4^-	Tetraborate	$B_4O_7^{2-}$				
Periodate	IO_4^-	Thiosulfate	$S_2O_3^{2-}$				
Permanganate	MnO_4^-	Tungstate	WO_4^{2-}				
Perrhenate	ReO_4^-						
Thiocyanate	SCN^-						
Vanadate	VO_3^-						



ACTIVITY SERIES OF METALS

Lithium
Potassium
Barium
Calcium
Sodium
Magnesium
Aluminum
Manganese
Zinc
Chromium
Iron
Cadmium
Cobalt
Nickel
Tin
Lead
Hydrogen
Antimony
Bismuth
Arsenic
Copper
Mercury
Silver
Platinum
Gold

SOLUBILITY RULES

A substance is considered to be soluble if more than 3 grams of a substance dissolve in 100mL of water. The more common rules are listed below.

1. All common salts of Group 1 elements and ammonium ion are soluble.
2. All common acetates and nitrates are soluble.
3. All binary compounds of Group 17 elements (other than F) with metals are soluble except those of silver, mercury(I), and lead.
4. All sulfates are soluble except those of barium, strontium, lead, calcium, silver, and mercury(I).
5. Except for those in Rule 1, carbonates, hydroxides, oxides, sulfides, and phosphates are insoluble.

COMMON EQUATIONS IN CHEMISTRY

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

$$W=\%I_1\times m_1+\%I_2\times m_2$$

$$C_1\times V_1=C_2\times V_2$$

$$K_{eq}=\frac{[C]^c\cdot[D]^d}{[A]^a\cdot[B]^b}$$

$$pH=-\log([H^+])$$

$$\%Error=\frac{|Actual-Measured|}{Actual}\cdot 100$$

$$Molarity=\frac{Moles\ of\ solute}{Liters\ of\ solution}$$