

Prefix	Symbol	Multiplier
tera	T	10 ¹²
giga	G	10 ⁹
mega	M	10 ⁶
kilo	k	10 ³
deci	d	10 ⁻¹
centi	c	10 ⁻²
milli	m	10 ⁻³
micro	μ or mc	10 ⁻⁶
nano	n	10 ⁻⁹

Conversions
1 pound = 453.6 grams
1 pound = 16 ounces
1 inch = 2.54 cm
1 foot = 12 inches
1 mile = 5280 feet
1 mile = 1.609 km
1 mL = 1 cm ³ = 1 cc
1 gallon = 4 quarts
1 liter = 1.06 quarts
1 tablespoon = 3 teaspoons
1 teaspoon = 5 mL
1 calorie = 4.184 J
1 atm = 760 mmHg = 760 torr

Know the abbreviations and names of shaded elements.

PERIOD	1 IA	2 IIA	3 IIIB	4 IVB	5 VB	6 VIB	7 VIIB	8 VIII	9 IXB	10 XIB	11 XIIB	12 XIIIB	13 IIIA	14 IVA	15 VA	16 VIA	17 VIIA	18 VIIIA
1	H Hydrogen																	He Helium
2	Li Lithium	Be Beryllium											B Boron	C Carbon	N Nitrogen	O Oxygen	F Fluorine	Ne Neon
3	Na Sodium	Mg Magnesium											Al Aluminum	Si Silicon	P Phosphorus	S Sulfur	Cl Chlorine	Ar Argon
4	K Potassium	Ca Calcium	Sc Scandium	Ti Titanium	V Vanadium	Cr Chromium	Mn Manganese	Fe Iron	Co Cobalt	Ni Nickel	Cu Copper	Zn Zinc	Ga Gallium	Ge Germanium	As Arsenic	Se Selenium	Br Bromine	Kr Krypton
5	Rb Rubidium	Sr Strontium	Y Yttrium	Zr Zirconium	Nb Niobium	Mo Molybdenum	Tc Technetium	Ru Ruthenium	Rh Rhodium	Pd Palladium	Ag Silver	Cd Cadmium	In Indium	Sn Tin	Sb Antimony	Te Tellurium	I Iodine	Xe Xenon
6	Cs Cesium	Ba Barium	Lu Lutetium	Hf Hafnium	Ta Tantalum	W Tungsten	Re Rhenium	Os Osmium	Ir Iridium	Pt Platinum	Au Gold	Hg Mercury	Tl Thallium	Pb Lead	Bi Bismuth	Po Polonium	At Astatine	Rn Radon
7	Fr Francium	Ra Radium	Lr Lawrencium	Rf Rutherfordium	Db Dubnium	Sg Seaborgium	Bh Bohrium	Hs Hassium	Mt Meitnerium	Ds Darmstadtium	Rg Roentgenium	Cn Copernicium	Nh Nihonium	Fl Flerovium	Mc Moscovium	Lv Livermorium	Ts Tennessine	Og Oganesson

57 La Lanthanum	58 Ce Cerium	59 Pr Praseodymium	60 Nd Neodymium	61 Pm Promethium	62 Sm Samarium	63 Eu Europium	64 Gd Gadolinium	65 Tb Terbium	66 Dy Dysprosium	67 Ho Holmium	68 Er Erbium	69 Tm Thulium	70 Yb Ytterbium
89 Ac Actinium	90 Th Thorium	91 Pa Protactinium	92 U Uranium	93 Np Neptunium	94 Pu Plutonium	95 Am Americium	96 Cm Curium	97 Bk Berkelium	98 Cf Californium	99 Es Einsteinium	100 Fm Fermium	101 Md Mendelevium	102 No Nobelium

Nuclear Decay Reactions

Type of radiation	Symbol	Mass number	charge
Alpha particle	α or ${}^4_2\text{He}$	4	2+
Beta particle	β or ${}^0_{-1}e$	0	1-
Gamma ray	γ or ${}^0_0\gamma$	0	0
Neutron	1_0n	1	0
Positron	β ⁺ or 0_1e	0	1+

Strong Acids

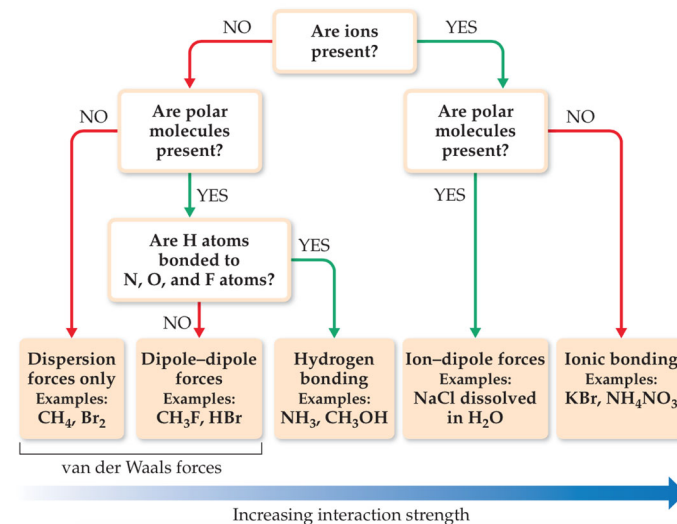
HCl, HBr, HI,
HNO₃, HClO₄, H₂SO₄

Strong Bases

Group I & II
metal hydroxides

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Intermolecular Forces



Concentration Unit	Definition
molarity (M)	$\frac{\text{mol solute}}{\text{L solution}}$
molality (m)	$\frac{\text{mol solute}}{\text{kg solvent}}$
mole fraction (c)	$\frac{\text{moles of solute}}{\text{moles of solute} + \text{moles of solvent}}$
percent by mass (%)	$\frac{\text{mass of solute}}{\text{mass of solution}} \times 100$
parts per million (ppm)	$\frac{\text{mass of solute}}{\text{mass of solution}} \times 10^6$
parts per billion (ppb)	$\frac{\text{mass of solute}}{\text{mass of solution}} \times 10^9$

Soluble compounds contain	Except when paired with
Group I metal cations or NH ₄ ⁺	None
CH ₃ COO ⁻ , NO ₃ ⁻ , ClO ₃ ⁻ or ClO ₄ ⁻	None
Cl ⁻ , Br ⁻ , or I ⁻	Ag ⁺ , Hg ₂ ²⁺ , Pb ²⁺
SO ₄ ²⁻	Ag ⁺ , Hg ₂ ²⁺ , Pb ²⁺ , Ca ²⁺ , Sr ²⁺ , Ba ²⁺
Insoluble compounds contain	Except when paired with
CO ₃ ²⁻ , CrO ₄ ²⁻ , PO ₄ ³⁻ , or SO ₃ ²⁻	Group I cations or NH ₄ ⁺
S ²⁻ or OH ⁻	Group I cations or NH ₄ ⁺ , or Ba ²⁺
Ag ⁺ , Hg ₂ ²⁺ , and Pb ²⁺	CH ₃ COO ⁻ , NO ₃ ⁻ , ClO ₃ ⁻ or ClO ₄ ⁻

Compounds listed as "slightly soluble" are treated as insoluble.