

Common Polyatomic Ions	
ammonium	NH_4^+
acetate	CH_3COO^-
carbonate	CO_3^{2-}
hydrogen carbonate (bicarbonate)	HCO_3^-
hydroxide	OH^-
nitrite	NO_2^-
nitrate	NO_3^-
chromate	CrO_4^{2-}
dichromate	$\text{Cr}_2\text{O}_7^{2-}$
phosphate	PO_4^{3-}
hydrogen phosphate	HPO_4^{2-}
dihydrogen phosphate	H_2PO_4^-
hypochlorite	ClO^-
chlorite	ClO_2^-
chlorate	ClO_3^-
perchlorate	ClO_4^-
permanganate	MnO_4^-
sulfite	SO_3^{2-}
sulfate	SO_4^{2-}
hydrogen sulfite (bisulfite)	HSO_3^-
hydrogen sulfate (bisulfate)	HSO_4^-
cyanide	CN^-
peroxide	O_2^{2-}
borate	BO_3^{3-}
iodate	IO_3^-

Prefix	Symbol	Multiplier	Conversions
tera	T	10^{12}	1 pound = 453.6 grams
giga	G	10^9	1 inch = 2.54 cm
mega	M	10^6	1 foot = 12 inches
kilo	k	10^3	1 mile = 5280 feet
deci	d	10^{-1}	1 mile = 1.609 km
centi	c	10^{-2}	1 mL = $1\text{ cm}^3 = 1\text{ cc}$
milli	m	10^{-3}	1 gallon = 4 quarts
micro	μ	10^{-6}	1 liter = 1.06 quarts
nano	n	10^{-9}	1 atm = 760 mmHg = 760 torr
pico	p	10^{-12}	molar volume of gas = 22.4 L/mol at STP
femto	f	10^{-15}	

105, 109, 110

Electron geometry	Hybridization
linear	sp
trigonal planar	sp^2
tetrahedral	sp^3

Strong Acids	Strong Bases
HCl, HBr, HI, HNO ₃ , HClO ₄ , H ₂ SO ₄	Group I & II metal hydroxides

Soluble compounds contain	Except when paired with
Group I metal cations or NH_4^+	None
CH_3COO^- , 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_3COO^- , NO_3^- , ClO_3^- , or ClO_4^-

Compounds listed as “slightly soluble” are treated as insoluble.

Know the abbreviations and names of shaded elements.																	
1 1A H Hydrogen	2 IIA He Helium	3 IIIA B Boron	4 IVA C Carbon	5 VA N Nitrogen	6 VIA O Oxygen	7 VIIA F Fluorine	8 VIIIA Ne Neon	9 IXB Ar Argon	10 X Kr Krypton	11 XI Xe Xenon	12 XII Rn Radon	13 IIIA Al Aluminum	14 IVA Si Silicon	15 VA P Phosphorus	16 VIA S Sulfur	17 VIIA Cl Chlorine	18 VIIIA Ar Argon
19 K Potassium	20 Ca Calcium	21 Sc Scandium	22 Ti Titanium	23 V Vanadium	24 Cr Chromium	25 Mn Manganese	26 Fe Iron	27 Co Cobalt	28 Ni Nickel	29 Cu Copper	30 Zn Zinc	31 Ga Gallium	32 Ge Germanium	33 As Arsenic	34 Se Selenium	35 Br Bromine	36 Kr Krypton
37 Rb Rubidium	38 Sr Strontium	39 Y Yttrium	40 Zr Zirconium	41 Nb Niobium	42 Mo Molybdenum	43 Tc Technetium	44 Ru Ruthenium	45 Rh Rhodium	46 Pd Palladium	47 Ag Silver	48 Cd Cadmium	49 In Indium	50 Sn Tin	51 Sb Antimony	52 Te Tellurium	53 I Iodine	54 Xe Xenon
55 Cs Cesium	56 Ba Barium	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	71 Lu Lutetium	72 Hf Hafnium
73 Ta Tantalum	74 W Tungsten	75 Re Rhenium	76 Os Osmium	77 Ir Iridium	78 Pt Platinum	79 Au Gold	80 Hg Mercury	81 Tl Thallium	82 Pb Lead	83 Bi Bismuth	84 Po Polonium	85 At Astatine	86 Rn Radon	87 Fr Francium	88 Ra Radium	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	103 Lr Lawrencium	104 Rf Rutherfordium	105 Db Dubnium	106 Sg Seaborgium	107 Bh Bohrium	108 Hs Hassium
109 Mt Meitnerium	110 Ds Darmstadtium	111 Rg Roentgenium	112 Cn Copernicium	113 Nh Nihonium	114 Fl Fleetsium	115 Mc Moscovium	116 Lv Livermorium	117 Ts Tennessine	118 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

Number of electron pairs	Electron pair geometries: 0 lone pair	1 lone pair	2 lone pairs	3 lone pairs	4 lone pairs
2	 Linear				
3	 Trigonal planar	 Bent or angular			
4	 Tetrahedral	 Trigonal pyramid	 Bent or angular		
5	 Trigonal bipyramid	 Sawhorse or seesaw	 T-shape	 Linear	
6	 Octahedral	 Square pyramid	 Square planar	 T-shape	 Linear