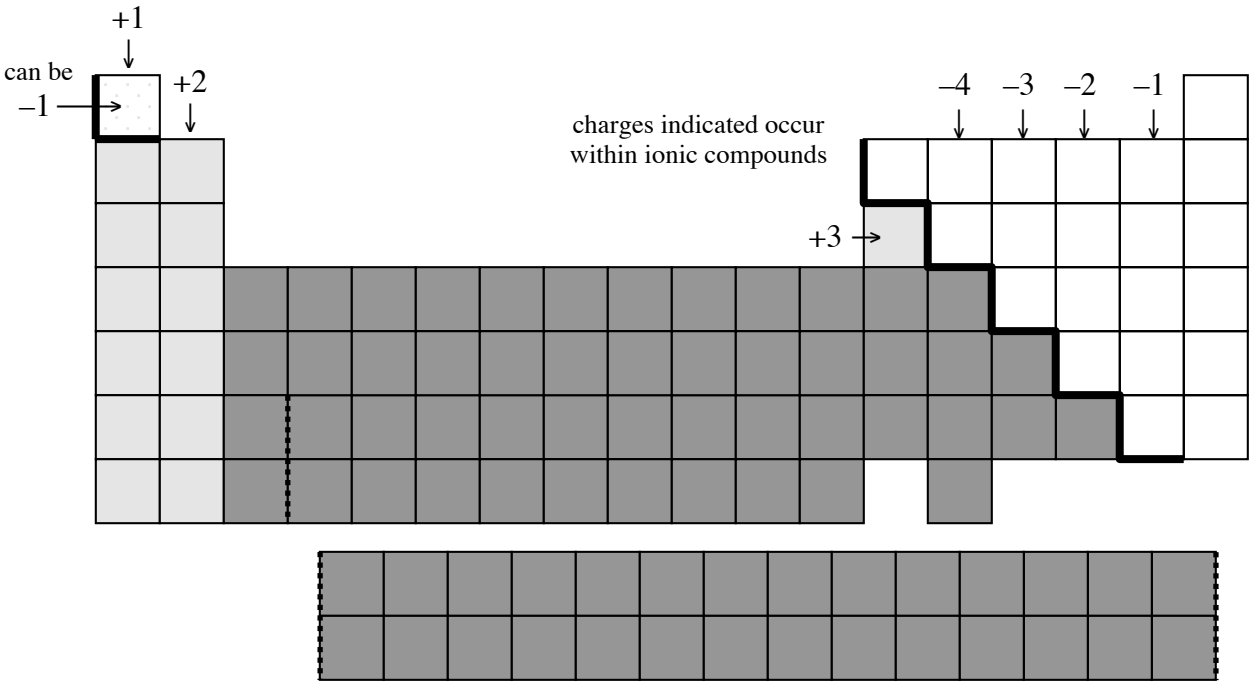
Chemical Nomenclature for Chemistry 11



Categories of elements:

- "Type I" metal
- "Type II" metal
- nonmetal

Polyatomic ions:

NH_4^+	ammonium
OH^-	hydroxide
NO_3^-	nitrate
SO_4^{2-}	sulfate
PO_4^{3-}	phosphate
CH_3COO^-	acetate
CO_3^{2-}	carbonate
HSO_4^-	hydrogen sulfate ($H^+ + SO_4^{2-}$)
HPO_4^{2-}	hydrogen phosphate ($H^+ + PO_4^{3-}$)
$H_2PO_4^-$	dihydrogen phosphate ($2\ H^+ + PO_4^{3-}$)
HCO_3^-	hydrogen carbonate (bicarbonate) ($H^+ + CO_3^{2-}$)

Binary ionic compounds (metal + nonmetal)

- Metal cations (+ charge) and nonmetal anions (– charge) are present in the appropriate ratio such that the compound has no net charge

  Nomenclature for "Type I" compounds

  ☐ alkali metal (+1); alkaline earth metal (+2); Al (+3); or ammonium cation

  ☐ hydride (–1); halogen (–1); O, S, Se, Te (–2); N, P (–3); C, Si (–4) (anion name is designated with the "ide" suffix); or polyatomic anion

  examples: $CaCl_2$ Al_2O_3

  CaH_2 $(NH_4)_2CO_3$

  Nomenclature for "Type II" compounds

  ■ all other metals (Roman numeral in parentheses after name of metal specifies its charge)

  ☐ hydride (–1); halogen (–1); O, S, Se, Te (–2); N, P (–3); C, Si (–4) (anion name is designated with the "ide" suffix); or polyatomic anion

  examples: Fe_2O_3 FeS

Acids (hydrogen + nonmetal/polyatomic ion)

- Hydrogen cations (+1 charge) (called "protons") and nonmetal or polyatomic anions (– charge) are present in the appropriate ratio such that the compound has no net charge

HCl	hydrochloric acid (and halogen analogues)
HNO_3	nitric acid
H_2SO_4	sulfuric acid
H_3PO_4	phosphoric acid
CH_3COOH	acetic acid

- Note that the polyatomic anions that are relevant to Chemistry 11 (listed on the previous page) are those that are derived from these acids by loss of one or more protons

Binary covalent compounds (nonmetal + nonmetal)

- Only nonmetal atoms are present

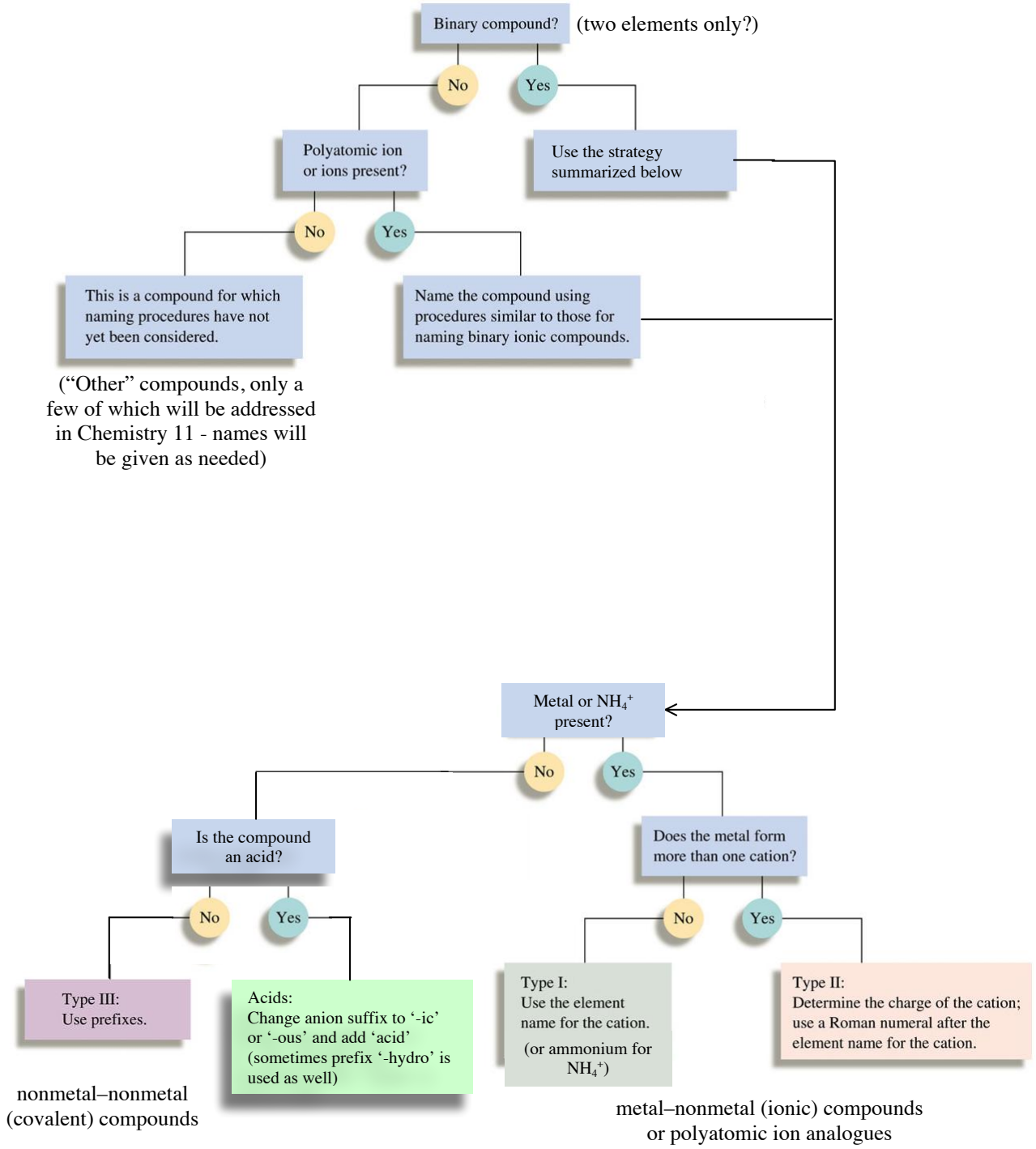
  "Type III" nomenclature

  ☐☐ (mono), di, tri, tetr(a), pent(a)… prefixes for each element designate number present
  (second element name is designated with the "ide" suffix)
  (mono is used only for the second element)
  (the "o" or "a" at the end of the prefix may be dropped with "oxide")

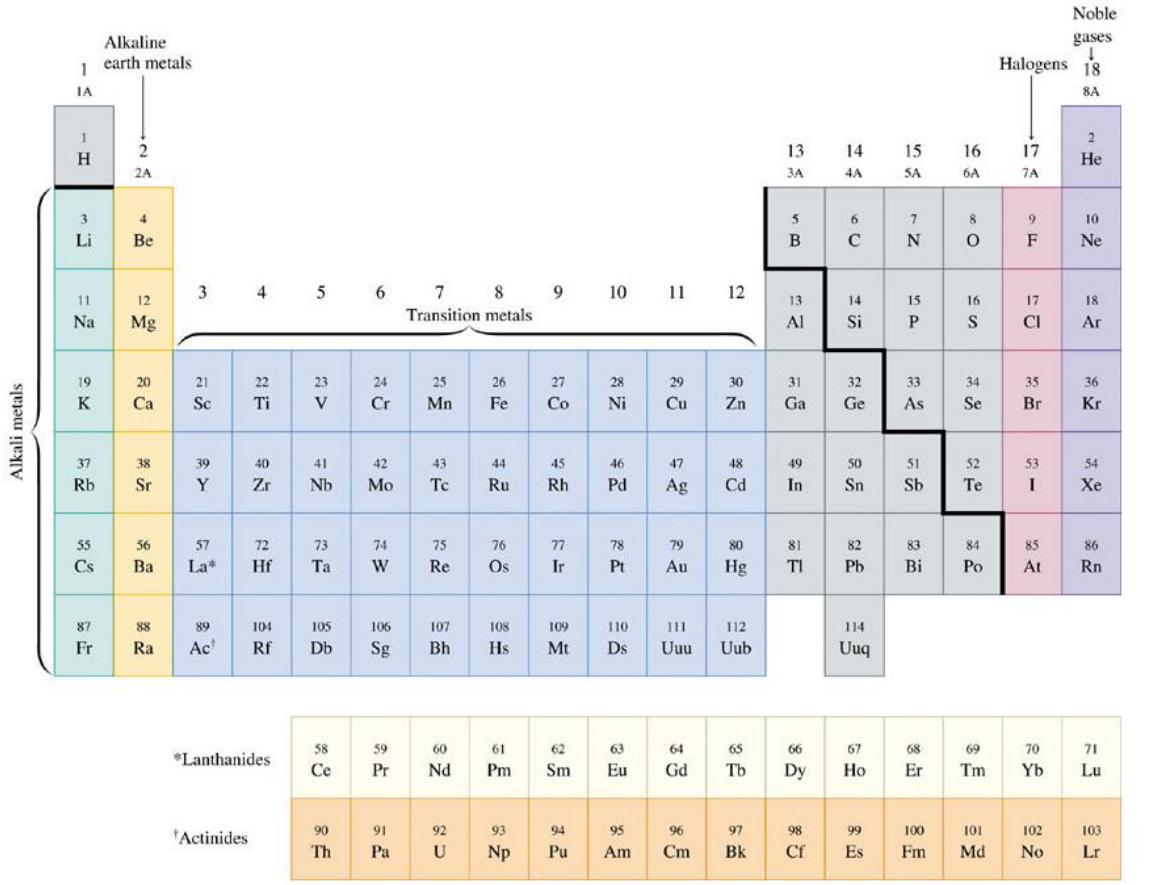
  examples: CO P_2O_5

Flowchart for Chemical Nomenclature

These flowcharts adapted from Figures 2.22 and 2.23 in the Zumdahl text should help to clarify the strategy for naming compounds in Chemistry 11, particularly for compounds that contain polyatomic ions.



Periodic Table of the Elements



Names and Symbols for the Elements

Actinium	Ac	Gold	Au	Praseodymium	Pr
Aluminum	Al	Hafnium	Hf	Promethium	Pm
Americium	Am	Hassium	Hs	Protactinium	Pa
Antimony	Sb	Helium	He	Radium	Ra
Argon	Ar	Holmium	Ho	Radon	Rn
Arsenic	As	Hydrogen	H	Rhenium	Re
Astatine	At	Indium	In	Rhodium	Rh
Barium	Ba	Iodine	I	Rubidium	Rb
Berkelium	Bk	Iridium	Ir	Ruthenium	Ru
Beryllium	Be	Iron	Fe	Rutherfordium	Rf
Bismuth	Bi	Krypton	Kr	Samarium	Sm
Bohrium	Bh	Lanthanum	La	Scandium	Sc
Boron	B	Lawrencium	Lr	Seaborgium	Sg
Bromine	Br	Lead	Pb	Selenium	Se
Cadmium	Cd	Lithium	Li	Silicon	Si
Calcium	Ca	Lutetium	Lu	Silver	Ag
Californium	Cf	Magnesium	Mg	Sodium	Na
Carbon	C	Manganese	Mn	Strontium	Sr
Cerium	Ce	Meitnerium	Mt	Sulfur	S
Cesium	Cs	Mendelevium	Md	Tantalum	Ta
Chlorine	Cl	Mercury	Hg	Technetium	Tc
Chromium	Cr	Molybdenum	Mo	Tellurium	Te
Cobalt	Co	Neodymium	Nd	Terbium	Tb
Copper	Cu	Neon	Ne	Thallium	Tl
Curium	Cm	Neptunium	Np	Thorium	Th
Darmstadtium	Ds	Nickel	Ni	Thulium	Tm
Dubnium	Db	Niobium	Nb	Tin	Sn
Dysprosium	Dy	Nitrogen	N	Titanium	Ti
Einsteinium	Es	Nobelium	No	Tungsten	W
Erbium	Er	Osmium	Os	Uranium	U
Europium	Eu	Oxygen	O	Vanadium	V
Fermium	Fm	Palladium	Pd	Xenon	Xe
Fluorine	F	Phosphorus	P	Ytterbium	Yb
Francium	Fr	Platinum	Pt	Yttrium	Y
Gadolinium	Gd	Plutonium	Pu	Zinc	Zn
Gallium	Ga	Polonium	Po	Zirconium	Zr
Germanium	Ge	Potassium	K		