Type II Binary Ionic Nomenclature

Transition metal cation

1) Formulas

- write symbol & charge (Roman charge) of metal cation
- write symbol & charge of nonmetal anion
- Criss-cross charges.

Ex) iron (II) oxide

Fe^{2+} O^{2-}

$\boxed{FeO}$ blue-grey

iron (III) oxide

Fe^{3+} O^{2-}

$\boxed{Fe_2O_3}$ rust

lead (II) sulfide

Pb^{2+} S^{2-}

$\boxed{PbS}$

lead (IV) sulfide

Pb^{4+} S^{2-}

$Pb_2S_4 \Rightarrow \boxed{PbS_2}$

molybdenum (VII) fluoride

Mo^{7+} F^{1-}

$\boxed{MoF_7}$

2) Names

- Write name of the metal cation, write the original charge of the metal as a Roman numeral.
- write name of nonmetal anion, change ending to -ide.

Ex) CoF_3

$1(x) + 3(-1) = 0$

cobalt (III) fluoride

$1(x) + 1(-2) = 0$

MnS

manganese (II) sulfide

UN_3

$1(x) + 3(-3) = 0$

uranium (IX) nitride

$\boxed{2(x) + 1(-2) = 0}$

Cu_2O

copper (I) oxide

$1(x) + 1(-2) = 0$

SnS

tin (II) sulfide

SnS_2 $1(x) + 2(-2) = 0$

tin (IV) sulfide

Type II Tertiary Ionic Nomenclature

1) Formulas
- Write symbol + charge of metal cation
- Write symbol + charge of nonmetal anion.
- Criss-cross charges. Use parentheses if needed.

Ex) Copper (II) chromate

Cu^{2+} CrO_4^{2-}

$CuCrO_4$

Nickel (I) sulfite

Ni^{1+} SO_3^{2-}

Ni_2SO_3

Mercury (II) permanganate

Hg^{2+} MnO_4^{-1}

$Hg(MnO_4)_2$

tin (IV) carbonate

Sn^{4+} CO_3^{2-}

$Sn_2(CO_3)_4 \Rightarrow Sn(CO_3)_2$

2) Names

Write name of metal cation. Write original charge as a Roman numeral.

Write name of polyatomic anion.

$1(x) + 3(-1) = 0$

Ex) $Pd(NO_2)_3$

palladium (III) nitrite

$Zn_3(PO_4)_2$

zinc (II) phosphate

$3(x) + 2(-3) = 0$

$3x + \cancel{-6} = 0$

$\cancel{+6} \quad +6$

$3x = 6$

$x = 2$

$Pb(SO_4)_2$

lead (IV) sulfate

$1(x) + 2(-2) = 0$

$1x + \cancel{-4} = 0$

$\cancel{+4} \quad +4$

$1x = +4$