

Chemistry (A/HA) Binary Formulas Formed Between:

- Metals with multiple oxidation states (transition elements) and non-metal ions and how to name the compounds using the IUPAC accepted nomenclature: The Stock System of Nomenclature

- (1) Formula writing is identical to binary formulas done previously where the metal only has 1 ion charge
- (2) Name must change to indicate which oxidation state the metal is using. A Roman numeral is used right after the metal name to indicate this. *(Example)*

Element	Ion	Chemical Name	Element	Ion	Chemical Name
Chromium	Cr^{2+}	chromium(II)	Lead	Pb^{2+}	lead(II)
	Cr^{3+}	chromium(III)		Pb^{4+}	lead(IV)
	Cr^{6+}	chromium(VI)		Manganese	Mn^{2+}
Copper	Cu^{+}	copper(I)	Mn^{4+}		manganese(IV)
	Cu^{2+}	copper(II)	Gold		Au^{+}
	Iron	Fe^{2+}		iron(II)	Au^{3+}
Fe^{3+}		iron(III)		Au^{5+}	gold(V)
Fe^{6+}		iron(VI)	Au^{7+}	gold(VII)	

Example: (1) Combine all Chromium ions with Oxygen (2) write the name (3) write the formula

Solutions:

- (1) Cr^{2+} and O^{2-} (a) Chromium(II) oxide (b) CrO
- (2) Cr^{3+} and O^{2-} (a) Chromium(III) oxide (b) Cr_2O_3
- (3) Cr^{6+} and O^{2-} (a) Chromium(VI) oxide (b) CrO_3

Assignment do in your notebook:

Write names and formulas for:

- (1) All ions of copper with chlorine (2) All ions of nickel with chlorine
- (3) All ions of iron with sulfur (4) All ions of tin with phosphorus
- (5) All ions of lead with oxygen (6) All ions of tin with phosphorus