

# Multivalent Compounds: Naming and Writing Formulas

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- referring to the **transition metals**
  - these are usually after atomic # 20
  - these have more than one charge
- ex Lead **+2, +4**  
Iron **+3, +2**  
Gold **+1, +3**

When naming these compounds, you must use **Roman Numerals** to indicate which ion charge has been used

I	1	III	3	V	5	VII	7
II	2	IV	4	VI	6	VIII	8

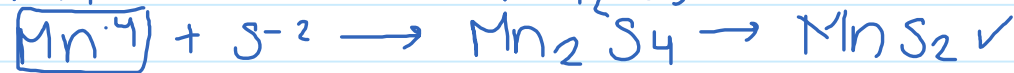
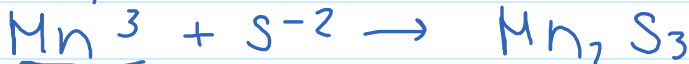
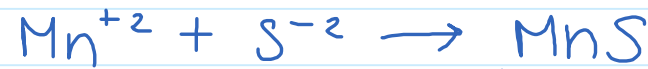
## Naming STEPS

- 1 Write the name of the **metal** element first, the **non-metal** second and change its ending to **"ide"**
- 2 Write the **metal ion CHARGE** in **roman numerals**, inside **BRACKETS**, after the metal

Ex. #1

- (a) AuCl → Gold (I) chloride  $\text{Au}^{+1} + \text{Cl}^{-1} \rightarrow \text{AuCl}$   
 $\text{Au}^{+3} + \text{Cl}^{-1} \rightarrow \text{AuCl}_3$
- (b) Fe<sub>2</sub>O<sub>3</sub> → Iron (III) oxide  $\text{Fe}^{+3} + \text{O}^{-2} \rightarrow \text{Fe}_2\text{O}_3 \checkmark$   
 $\text{Fe}^{+2} + \text{O}^{-2} \rightarrow \text{FeO}$
- (c) MnS<sub>2</sub> → Manganese (IV) sulphide

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### Writing formulas

1. Write the **metal** and **non-metal** elements in their ion form

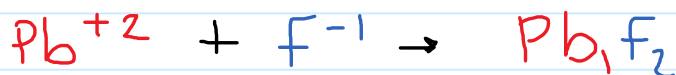
\* the roman numeral tells you which ion charge to use!!!

2. Re-write the elements without ion charges and criss-cross the numbers

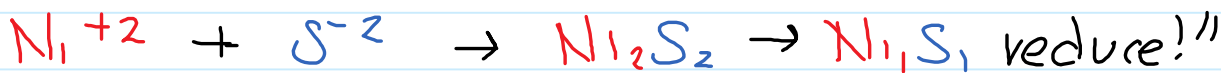
\* if there is a common factor → REDUCE!!

### Ex. #2

(a) Lead (II) fluoride PbF<sub>2</sub> 3 atoms



(b) Nickel (II) sulphide NiS 2 atoms



(c) Tin (IV) oxide SnO<sub>2</sub> 3 atoms

