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Naming & Formula Writing for Type 1 Ionic Compounds

What is a Type 1 Compound?

- These compounds are binary, in that they are made up of two types of elements.
- It is made up of a metal from columns 1, 2 or 13 and a nonmetal.
- These metals have only one charge or oxidation state.
- Group 1 metals have a +1 charge.
- Group 2 metals have a +2 charge.
- Group 13 metals have a +3 charge.

Steps for naming:

- Write the name of the metal.
- Write the root of the nonmetal and add the -ide suffix.

Examples of Naming:

- NaCl sodium chloride
- Al₂S₃ aluminum sulfide

Correctly name the following compounds.

- Correct answers:
1. NaBr Sodium Bromide ✓ Sodium Bromide
 2. Li₂O Lithium Oxide ✓ Lithium Oxide
 3. NaCl Sodium Chloride ✓ Sodium Chloride
 4. KI Potassium Iodide ✓ Potassium Iodide
 5. CaS Calcium Sulfide ✓ Calcium Sulfide
 6. MgO Magnesium Oxide ✓ Magnesium oxide
 7. CsF Cesium Fluoride ✓ Cesium Fluoride
 8. AlCl₃ Aluminum Chloride ✓ Aluminum Chloride
 9. MgI₂ Magnesium Iodide ✓ Magnesium Iodide
 10. Rb₂O Rubidium Oxide ✓ Rubidium oxide
 11. SrI₂ Strontium Iodide ✓ Strontium Iodide
 12. K₂S Potassium sulfide ✓ Potassium Sulfide

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Steps for formula writing for Type one compounds:

- Write the symbol and oxidation state (or charge) for the metal.
- Write the symbol and oxidation state (or charge) for the nonmetal.
- If the two charges add up to zero, you are finished with writing the formula.
- If the two charges do not add up to zero, criss-cross the charges thus creating subscripts.

Examples of Formula Writing:

- calcium oxide $\text{Ca}^{2+}\text{O}^{2-}$ (+2 and -2 = zero) answer: CaO
- aluminum oxide $\text{Al}^{3+}\text{O}^{2-}$ (+3 and -2 ≠ zero) Al_2O_3 answer: Al₂O₃

Note: *Superscripts* stand for the oxidation number or charge on the ion to their left.
Subscripts tell how many of each type of element are in the compound.

Correctly write the formulas for the following compounds.

- Correct answer:
13. sodium iodide Na^+I^- (+1 and -1 = zero) NaI ✓ NaI
 14. magnesium fluoride Mg^{2+}F^- (+2 and -1 ≠ zero) MgF₂ ✓ MgF₂
 15. strontium chloride $\text{Sr}^{2+}\text{Cl}^-$ (+2 and -1 ≠ zero) SrCl₂ ✓ SrCl₂
 16. aluminum sulfide $\text{Al}^{3+}\text{S}^{2-}$ (+3 and -2 ≠ zero) Al₂S₃ ✓ Al₂S₃
 17. lithium bromide Li^+Br^- (+1 and -1 = zero) LiBr ✓ LiBr
 18. calcium nitride $\text{Ca}^{2+}\text{N}^{3-}$ (+2 and -3 ≠ zero) Ca₃N₂ ✓ Ca₃N₂
 19. barium oxide $\text{Ba}^{2+}\text{O}^{2-}$ (+2 and -2 = zero) BaO ✓ BaO