

Ionic Compounds

Recall: an ionic compound is made of a positive ion (it lost e) and a negative ion (it gained the e) that join (bond) together.

The main idea for an ionic compound is that the total e lost = the total e gained. In other words the total positive charge balances out the total negative charge (the compound has 0 total charge).

To write ionic names:

1. Name each ION involved. (for metals, same as element name; for non-metals same as element but with ide ending)
2. DO NOT include how many ions are involved.

Ex. NaCl = Sodium Chloride

Ex. Al₂O₃ = Aluminum Oxide

What that means is that 2 aluminums are needed to balance out 3 oxygens. 6+ balances 6-. If we drew the Bohr diagrams, we would see that this is the only way to get everyone to have a full valence shell.

To write formulas:

1. Write each the symbol for each element and note the ion charge of each.
2. Use subscripts to show how many copies of each ion are needed to ensure the total charges balance out.

Ex. Sodium Oxide = Na₂O (2 Na make a 2+ charge to balance out the 2- charge from 1 Oxide)

If we drew out the Bohr diagrams, we'd see that each sodium gives 1 e to the oxygen (which needs 2 e); then everyone gets a full valence shell.

Ex. Scandium Sulphide = Sc₂S₃

Ionic compounds in all their glory

To make ionic formulas

1. Write the symbol for each ion & note their charges
 - a. If the negative ion ends in "ate" or "ite" → polyatomic ion
 - b. If the ending is "ide" → simple non-metal except: Hydroxide OH⁻ or Cyanide CN⁻
2. Use subscripts to make multiples of the ions such that CHARGES BALANCE

To make ionic names:

1. Name each ION involved (Positive ion first, Negative ion second)
 - a. Metals → same as element. Multivalent metals have ion charge indicated by roman numerals in brackets
 - b. Non-metals → same as element with ending changed to "ide"
 - c. Polyatomic ions → name given in ion chart (you can notice the polyatomic ions if there are more than 2 elements in the compound and/or if there are brackets)
2. DON'T include how many ions (NO PREFIXES)

Ex. MnO₂

Ex. Cr₂(SO₃)₃

Ex. Os(Cr₂O₇)₂

Naming Ionic Compounds

Name the following Ionic compounds:

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|------------------------------------|--|
| 1. NaCl | 8. Be(NO ₂) ₂ |
| 2. MgO | 9. Al ₂ (SO ₄) ₃ |
| 3. AlP | 10. Pb(OH) ₂ |
| 4. BeCl ₂ | 11. Na ₃ PO ₄ |
| 5. KBr | 12. Cu ₂ S |
| 6. Zn ₃ As ₂ | 13. CoCl ₂ |
| 7. LiNO ₃ | 14. Au ₂ (CrO ₄) ₃ |

Write the formula for the following Ionic compounds:

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|---------------------------|-------------------------|
| 1. Calcium Chloride | 6. Potassium Cyanide |
| 2. Lithium Fluoride | 7. Iron (III) Hydroxide |
| 3. Sodium Bicarbonate | 8. Yttrium Oxide |
| 4. Platinum (II) Sulphide | 9. Ammonium Nitrate |
| 5. Zinc Phosphate | 10. Gallium Chloride |