

Naming Oxyanions

Unit: Nomenclature & Formulas

NGSS Standards/MA Curriculum Frameworks (2016): HS-PS2-6

Mastery Objective(s): (Students will be able to...)

- Write names for ionic compounds that contain oxyanions.
- Write chemical formulas for ionic compounds that contain oxyanions.

Success Criteria:

- Compound names contain the correct cation (including a Roman numeral if necessary) and the correct anion (with prefix and suffix that together determine the number of oxygen atoms).
- Chemical formulas have correctly balanced charges.
- Chemical formulas have polyatomic ions in parentheses when necessary.

Tier 2 Vocabulary: compound, anion

Language Objectives:

- Explain what the prefix and suffix tell about the number of oxygens in an anion.

Notes:

oxyanion (or oxoanion): polyatomic anion (negative polyatomic ion) that contains oxygen.

Examples: NO_3 (nitrate), PO_4 (phosphate), SO_3 (sulfite)

Use this space for summary and/or additional notes:

Naming Oxyanions

The names of oxyanions always end in either “ate” or “ite”, depending on the *relative* number of oxygens.

Note that most of the “____ate” ions have either three or four oxygens, but there is no way to predict how many oxygens any particular “____ate” ion will have.

- The “____ate” ion has its own specific formula and charge.
- The “____ite” ion has one fewer oxygen than the “____ate” ion, and the same charge.

Some examples:

“____ate” ion	formula	“____ite” ion	formula
sulfate	SO_4^{2-}	sulfite	SO_3^{2-}
chlorate	ClO_3^-	chlorite	ClO_2^-
nitrate	NO_3^-	nitrite	NO_2^-
phosphate	PO_4^{3-}	phosphite	PO_3^{3-}

If you have one fewer oxygen than the “____ite” ion, add the prefix “hypo”. Again, the charge stays the same. For example:

- chlorite = ClO_2^-
- hypochlorite = ClO^-

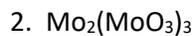
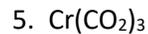
If you have one more oxygen than the “____ate” ion, add the prefix “per”. Again, the charge stays the same. For example:

- chlorate = ClO_3^-
- perchlorate = ClO_4^-

Use this space for summary and/or additional notes:

Homework Problems

Give the name for each of the following compounds. You may need to look up formulas for polyatomic ions in "Table K. Polyatomic Ions" in your Chemistry Reference Tables on page 540.



Give the chemical formula for each of the following compounds.

9. sodium nitrate

13. potassium dichromate

10. ammonium periodate

14. magnesium thiosulfite

11. calcium hypochlorite

15. potassium hypobromite

12. barium carbonite

16. sodium phthalate

Use this space for summary and/or additional notes: