Chemical Formulas For Simple Salts

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Let's Review Ions

- Metals
  - Large and weak
  - Electron donors
  - Form cations (+)
- Nonmetals
  - Small and strong
  - Electron acceptors
  - Form anions (-)
- These then combine to form ionic compounds - salts
- Today, we are going to develop a system for naming and writing formulas for salts

Chemical Formulas for Simple Salts

Chemical Formulas

- Chemical Formulas
  - Used to represent chemical compounds
  - 2 types of information
    - Composition
    - Ratio

$MgCl_2$

Al_2O_3

$Ca(NO_3)_2$

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Chemical Formulas

- Octet Rule
  - Atoms are most stable with a valence shell of 8 electrons
- Oxidation Numbers (oxidation state)
  - The charge an atom takes on when ionicly bonded
  - Many elements have complex sets of oxidation states
  - Which oxidation number do we use?
    - Metals (positive ion)
      - If there is only one - use it
      - If there is more than one - a roman numeral will indicate which to use
        - I, II, III, IV, V, VI, VII
    - Nonmetals (negative ion)
      - Use the negative charge
        - If there is more than 1, use the number predicted by the group

Chemical Formulas for Simple Salts

Writing Formulas

- General rules for ionic formulas
  - Always written cation first
  - All salts have a neutral charge
  - Cation name = doesn't change
  - Anion name = drop the ending and add -ide
- Least Common Multiple

Chemical Formulas for Simple Salts

Writing Formulas

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Chemical Formulas for Simple Salts

Writing Formulas

- Rules for writing ionic chemical formulas
  - Always written cation first
  - All compounds have a neutral charge
  - Cation name = doesn't change
  - Anion name = drop the ending and add -ide
- Lowest Common Multiple
  - Used to determine the charge at which the positive and negative charges will balance
- Steps for writing ionic chemical formulas
  - Write the abbreviations of the elements
  - Determine the charge of the ions (may need Roman numeral)
  - Determine the LCM
  - Determine how many of each ion is needed to create the LCM charge
  - Write the formula, given these subscripts

Chemical Formulas for Simple Salts

Let's Practice

- Write the chemical formulas for the following compounds
  - Calcium chloride
  - Aluminum sulfide
  - Iron nitride
  - Iron II nitride
  - Lead IV oxide