

Molecular Compounds: Formulas and Names

Contains only nonmetals

Covalent bonds

Name of first element (smaller group #) + prefix +
base name of second element + ide
Prefix when two or more elements

Prefixes for naming molecular compounds

<u>mono</u>	= 1	<u>hexa</u>	= 6
<u>di</u>	= 2	<u>hepta</u>	= 7
<u>tri</u>	= 3	<u>octa</u>	= 8
<u>tetra</u>	= 4	<u>nona</u>	= 9
<u>penta</u>	= 5	<u>deca</u>	= 10

Naming Acids

Molecular compounds that release H^+ when dissolved in water

Acidic H^+ always written first in the formula

Hydro + base name of nonmetal + ic + acid ← binary acids

Oxyanions

-ate: Base name of oxyanion + ic + acid

-ite: Base name of oxyanion + ous + acid

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graph TD
    A[IONIC  
Metal and nonmetal] --> B[Metal forms one type of ion only.]
    A --> C[Metal forms more than one type of ion.]
    B --> D[name of cation  
(metal)]
    B --> E[base name of anion (nonmetal) + -ide]
    D --> F[Example: CaCl2  
calcium chloride]
    E --> F
    C --> G[name of cation  
(metal)]
    C --> H["charge of cation (metal) in Roman numerals in parentheses"]
    C --> I[base name of anion (nonmetal) + -ide]
    G --> J[Example: FeCl3  
iron(III) chloride]
    H --> J
    I --> J

    K[MOLECULAR  
Nonmetals only] --> L[prefix]
    K --> M[name of 1st element]
    K --> N[prefix]
    K --> O[base name of 2nd element + -ide]
    L --> P[Example: P2O5  
diphosphorus pentoxide]
    M --> P
    N --> P
    O --> P

    Q[ACIDS*  
H and one or more nonmetals] --> R[Binary acids  
Two-element]
    Q --> S[Oxyacids  
Contain oxygen]
    R --> T[hydro]
    R --> U[base name of oxygen + -ic]
    R --> V[acid]
    T --> W[Example: HCl  
hydrochloric acid]
    U --> W
    V --> W
    S --> X[ate]
    S --> Y[ite]
    X --> Z[base name of oxygen + -ate]
    Y --> AA[acid]
    Z --> AB[Example: H3PO4  
phosphoric acid]
    AA --> AB
    S --> AC[base name of oxygen + -ous]
    S --> AD[acid]
    AC --> AE[Example: H2SO3  
sulfurous acid]
    AD --> AE
  
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Name	Formula	Formula	Name
Dinitrogen tetroxide	N_2O_4	$AlCl_3$	Aluminum chloride
Calcium sulfate	$CaSO_4$	$Mg(OH)_2$	Magnesium hydroxide
Zinc phosphate	$Zn_3(PO_4)_2$	N_2O	Dinitrogen monoxide
Perchloric acid	$HClO_4$	$Cr(NO_2)_3$	Chromium (III) nitrite
Copper(II) chloride	$CuCl_2$	HNO_2	Nitrous acid