

Ionic vs. Molecular - The Thought Process

Given the Name, Need the Formula

1. Does the name have any prefixes (mono, di, tri, tetra, penta)? If so this is *molecular*, if not go to question 2.

Molecular - write down the formula based on the prefixes.

Ex: carbon tetrahydride - CH_4

2. Does it start with ammonium, contain hydroxide or end in "ate" or "ite"? If so it is *polyatomic*, if not move to question 3.

Polyatomic: - Look up the charges for the polyatomic ion and whatever it is attached to. (Remember if there is a Roman Numeral in the name this is the charge on the 1st substance).

- Determine the formula by balancing the charges.

Ex: Sodium Carbonate - $\overset{+1}{\text{Na}} \overset{-1}{\text{CO}_3} - \text{NaCO}_3$

3. Must be *ionic* (to check this make sure the first substance is a metal)

Ionic: - Look up the charges for the metal and non-metal (Remember a Roman Numeral in the name gives the charge on the metal).

- Determine the formula by balancing the charges.

Ex: Lithium Oxide - $\overset{+1}{\text{Li}} \overset{-2}{\text{O}} - \text{Li}_2\text{O}$
X2

Given the Formula, Need the Name

1. Is there 3 or more elements in the substance? If so it is *polyatomic*, if not move to question 2.

Polyatomic: - Look up the polyatomic ion to see what it is called.
- Write down the ions in the order they appear in the formula.
- Check to see if the 1st substance is a metal with more than one charge, if it does figure out the charge and put a Roman Numeral between the two names.

Ex: H_2SO_4 - Hydrogen Sulphate

2. Is the first substance a metal? If so it is *ionic*, if not move to question 3.

Ionic: - write down the name of the metal followed by the non-metal, but change the ending of the non-metal to "ide".
- check to see if the metal (1st substance) has more than one charge, if it does figure out the charge and put a Roman Numeral between the two names.

Ex: K_2O - Potassium Oxide

3. Must be *molecular* (to check make sure both substances are non-metals)

Molecular - write out the name using prefixes (di, tri, tetra, penta), change the ending of the second substance to "ide".

Ex: CS_2 - Carbon disulphide

Ionic Compounds: Names and Formulas Worksheet

1. Write the formulas for the following compounds.

- | | |
|-----------------------------|------------------------------|
| (a) magnesium oxide _____ | (f) copper(I) bromide _____ |
| (b) sodium fluoride _____ | (g) tin(II) iodide _____ |
| (c) aluminum nitride _____ | (h) iron(III) chloride _____ |
| (d) potassium sulfide _____ | (i) calcium phosphide _____ |
| (e) lithium iodide _____ | (j) lead(II) oxide _____ |

2. Write the names for the following compounds.

- | | |
|---------------------------------|-----------------------------------|
| (a) Li_2O _____ | (f) PbS _____ |
| (b) AlCl_3 _____ | (g) SnO_2 _____ |
| (c) MgS _____ | (h) Na_2S _____ |
| (d) CaO _____ | (i) Mg_3P_2 _____ |
| (e) KBr _____ | (j) NiO _____ |

Polyatomic Ions- Names and Formulas

Name: _____

- | | |
|-----------------------------------|--------------------------------|
| 1. NaNO_3 _____ | 9. Sodium Nitrate _____ |
| 2. MgSO_4 _____ | 10. Ammonium Phosphate _____ |
| 3. NH_4SO_4 _____ | 11. Lead (IV) Hydroxide _____ |
| 4. K_3PO_4 _____ | 12. Iron (III) Carbonate _____ |
| 5. Al(OH)_3 _____ | 13. Magnesium Hydroxide _____ |
| 6. $\text{Pb(CO}_3)_2$ _____ | 14. Lithium Sulphate _____ |
| 7. AlPO_4 _____ | 15. Potassium Sulphite _____ |

Name: _____

Molecular Compounds: Names and Formulas Worksheet

1. Write the formulas for the following compounds:

- | | | | |
|----------------------------|-------|--------------------------|-------|
| a) carbon dioxide | _____ | b) diphosphorus trioxide | _____ |
| c) silicon dioxide | _____ | d) nitrogen monoxide | _____ |
| e) carbon disulfide | _____ | f) chlorine dioxide | _____ |
| g) sulfur trioxide | _____ | h) dinitrogen oxide | _____ |
| i) nitrogen trihydride | _____ | j) carbon monoxide | _____ |
| k) carbon tetrachloride | _____ | l) arsenic tribromide | _____ |
| m) dihydrogen dioxide | _____ | n) silicon carbide | _____ |
| o) carbon tetra hydride | _____ | p) sulfur dioxide | _____ |
| q) phosphorus pentabromide | _____ | | |

2. Write the names for the following compounds:

- | | | | |
|-------------|-------|-------------|-------|
| a) CF_4 | _____ | b) P_2O_5 | _____ |
| c) NH_3 | _____ | d) CH_4 | _____ |
| e) PBr_3 | _____ | f) SO_3 | _____ |
| g) H_2O | _____ | h) SiO_2 | _____ |
| i) CS_2 | _____ | j) PCl_3 | _____ |
| k) N_2O_4 | _____ | l) NO_2 | _____ |
| m) H_2O_2 | _____ | n) SF_4 | _____ |
| o) CO | _____ | p) SiC | _____ |

NAMING COMPOUNDS (MIXED)

Name _____

Name the following compounds.

1. NaCl _____
2. MnS _____
3. K₂O _____
4. CuBr₂ _____
5. CuBr _____
6. CO₂ _____
7. PbSO₄ _____
8. Li₂CO₃ _____
9. Na₂CO₃ _____
10. NO₂ _____

WRITING FORMULAS FROM NAMES

Name _____

Write the formulas for the following compounds.

1. carbon monoxide _____
2. sodium chloride _____
3. carbon tetrachloride _____
4. magnesium bromide _____
5. aluminum iodide _____
6. hydrogen hydroxide _____
7. iron (II) fluoride _____
8. carbon dioxide _____
9. sodium carbonate _____
10. ammonium sulfide _____

