

Name _____
 Box # _____ Period _____ Date ____/____/____

3 • Bonding, Nomenclature & Molecular Structure

WRITING IONIC FORMULAS

We have talked about three factors affecting stability of atoms/ions:

- 1) full valence shells (gaining or losing electrons), 2) low energy, and 3) neutral charge (sacrificed for full valence shells in ions).

Writing ionic formulas: 1) write positive ion, 2) use a numerical subscript to indicate how many are present if greater than 1, 3) write negative ion, 4) use a numerical subscript to indicate how many are present if greater than 1.

Complete the following table by determining how many of each ion is needed to create a compound with a neutral charge.

1 st ion	Oxidation #	2 nd ion	Oxidation #	# of 1 st ion	# of 2 nd ion	Formula
K		Cl		How many do you need to be neutral?		
Ca		O				
Be		Br				
Na		N				
Li		O				
Ba		I				
Fe	III	S				
Ag	I	F				
Cu	II	Cl				

Chemistry: Ions in Chemical Compounds

Complete the following table by writing the formula for the resulting compound.

<u>Ions</u>	Chloride	Hydroxide	Nitrate	Sulfate	Sulfide	Carbonate	Phosphate
Hydrogen							
Sodium							
Ammonium							
Potassium							
Calcium							
Magnesium							
Aluminum							
Iron(II)							
Iron(III)							
Lead(II)							
Tin(IV)							
Copper(I)							
Copper(II)							

Polyatomic Practice

Directions: If given the formula, write the name of the compound. If given its name, write the compound formula (remember to start with oxidation states in order to find the formula).

1. CoSO_4
2. SnO_2
3. Pb_3P_2
4. $(\text{NH}_4)_2\text{S}$
5. Hg_3P_2
6. $\text{Hg}_3(\text{PO}_4)_2$
7. Co_2SO_3
8. Calcium oxide
9. Cobalt(I) sulfide
10. Zinc phosphate
11. Titanium(II) bromide
12. Lead(IV) sulfide
13. Silver sulfate
14. Silver oxide
15. Barium nitrate
16. Cobalt(I) phosphate
17. Silver carbonate
18. Iron(III) sulfide
19. Iron(II) sulfite
20. Silver cyanide

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3• Bonding, Nomenclature & Molecular Structure

COMPOUNDS - POLYATOMIC IONS

Write the name of each of the following compounds.

- | | |
|---------------------------------------|-----------|
| 1. NH_4Cl | 1. _____ |
| 2. $\text{NaC}_2\text{H}_3\text{O}_2$ | 2. _____ |
| 3. $\text{Ca}(\text{MnO}_4)_2$ | 3. _____ |
| 4. BeSO_4 | 4. _____ |
| 5. $\text{Mg}(\text{NO}_2)_2$ | 5. _____ |
| 6. NH_4NO_3 | 6. _____ |
| 7. $\text{Sr}_3(\text{PO}_4)_2$ | 7. _____ |
| 8. $\text{Zn}(\text{ClO}_3)_2$ | 8. _____ |
| 9. AgHCO_3 | 9. _____ |
| 10. $\text{K}_2\text{Cr}_2\text{O}_7$ | 10. _____ |

Write the chemical formula for each of the given names.

- | | |
|------------------------|-----------|
| 11. sodium chromate | 11. _____ |
| 12. barium nitrate | 12. _____ |
| 13. ammonium sulfate | 13. _____ |
| 14. aluminum hydroxide | 14. _____ |
| 15. calcium phosphate | 15. _____ |
| 16. cesium cyanide | 16. _____ |
| 17. sodium nitrite | 17. _____ |
| 18. calcium acetate | 18. _____ |
| 19. beryllium chlorite | 19. _____ |
| 20. rubidium sulfite | 20. _____ |

3 • Bonding & Naming

COMPOUNDS WITH MULTIPLE-CHARGE IONS

Write the name of each of the following compounds.

- | | |
|-----------------------|-----------|
| 1. $V(ClO_3)_5$ | 1. _____ |
| 2. $Re(SO_4)_3$ | 2. _____ |
| 3. $Os(OH)_3$ | 3. _____ |
| 4. $Ir_3(PO_4)_4$ | 4. _____ |
| 5. $Pd(SO_3)_2$ | 5. _____ |
| 6. $AuNO_3$ | 6. _____ |
| 7. $FePO_3$ | 7. _____ |
| 8. $Ni(MnO_4)_2$ | 8. _____ |
| 9. $Pb(CN)_4$ | 9. _____ |
| 10. $Mn_2(Cr_2O_7)_7$ | 10. _____ |

Write the chemical formula for each of the given names.

- | | |
|--------------------------------|-----------|
| 11. copper (II) hydroxide | 11. _____ |
| 12. rhenium (VI) nitrate | 12. _____ |
| 13. niobium (III) sulfate | 13. _____ |
| 14. platinum (IV) permanganate | 14. _____ |
| 15. molybdenum (III) phosphate | 15. _____ |
| 16. titanium (II) cyanide | 16. _____ |
| 17. gold (I) nitrite | 17. _____ |
| 18. iron (III) acetate | 18. _____ |
| 19. cobalt (II) chlorite | 19. _____ |
| 20. tin (IV) sulfite | 20. _____ |

Name _____

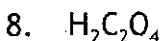
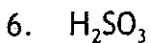
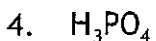
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3 · Bonding

Naming ACIDS

Acid Names

Write names for the following acids.



PART B - ACID FORMULAS

Write formulas for the following acids.

9. hydrofluoric acid

10. sulfuric acid

11. carbonic acid

12. hydrobromic acid

13. hypochlorous acid

14. nitrous acid

15. acetic acid

16. hydrosulfuric acid

Nomenclature 2.3

Acids

Worksheet

1) Name the following acids:

- | | |
|-----------------------------|----------------------------|
| a. CH_3COOH | f. HCl |
| b. HBrO_3 | g. HI |
| c. H_2CO_3 | h. H_2SO_3 |
| d. H_2SO_4 | i. HIO_3 |
| e. HF | j. HCN |

2) Write chemical formulas for the following acids:

- | | |
|--------------------|----------------------|
| a. Perchloric Acid | f. Nitrous Acid |
| b. Nitric Acid | g. Hydrochloric Acid |
| c. Hydroiodic Acid | h. Hydrobromic Acid |
| d. Acetic Acid | i. Chlorous Acid |
| e. Iodic Acid | j. Bromic Acid |


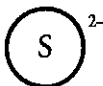

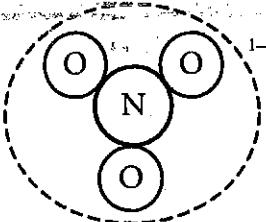
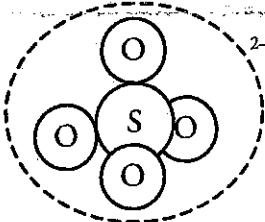
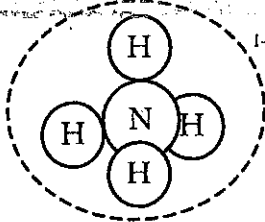
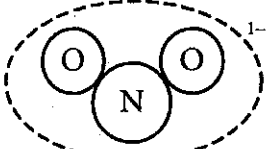
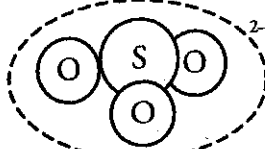
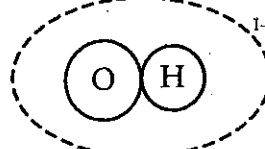
Polyatomic Ions

Can a group of atoms have a charge?

Why?

Do you know you eat a lot of "-ates"? Next time you look at a food label, read the ingredients and you will likely find a number of ingredients that end with "-ate," such as sodium phosphate or calcium carbonate. Did you ever wonder what the chemical formulas of these ingredients look like? In this activity we will explore polyatomic ions, which are groups of atoms that carry a charge. These ions are found in our food ingredients, natural waterways, and many other chemical compounds you encounter every day.

Model 1 – Types of Ions

Monatomic Ions	Nitride 	Sulfide 	Chloride 
Polyatomic Ions	Nitrate 	Sulfate 	Ammonium 
	Nitrite 	Sulfite 	Hydroxide 

1. Use Model 1 to complete the table below.

Name of Ion	Nitride	Nitrate	Sulfate	Sulfite	Ammonium
Charge on Ion		-1			
Type and Number of Atoms			1 sulfur 4 oxygen		
Chemical Formula				SO_3^{2-}	