

1. Student Name _____ Class _____

Element or ion	Symbol or formula	Number and kind of charge
1. aluminum	Al	+3
2. ammonium	_____	_____
3. antimony	_____	_____
4. barium	_____	_____
5. bromide	_____	_____
6. calcium	_____	_____
7. carbonate	_____	_____
8. chloride	_____	_____
9. copper(II)	_____	_____
10. fluoride	_____	_____
11. hydrogen carbonate	_____	_____
12. acetate	_____	_____
13. hydroxide	_____	_____
14. iron(II)	_____	_____
15. iron(III)	_____	_____
16. tin (IV)	_____	_____
17. hydride	_____	_____
18. mercury(II)	_____	_____
19. lead II	_____	_____
20. nitrate	_____	_____
21. oxide	_____	_____
22. phosphate	_____	_____
23. potassium	_____	_____
24. sulfide	_____	_____
25. sodium	_____	_____
26. sulfate	_____	_____
27. silver	_____	_____
28. zinc	_____	_____
29. cyanide	_____	_____

Corrected by _____

	Formulas
1. sodium chloride	_____
2. ammonium hydroxide	_____
3. calcium sulfate	_____
4. magnesium nitrate	_____
5. aluminum phosphate	_____
6. zinc chloride	_____
7. mercury(II) oxide	_____
8. aluminum sulfate	_____
9. silver nitrate	_____
10. barium hydroxide	_____
11. potassium sulfide	_____
12. iron(II) sulfate	_____
13. tin (IV) chloride	_____
14. copper I carbonate	_____
15. calcium acetate	_____
16. iron(III) sulfate	_____
17. calcium phosphate	_____
18. zinc sulfide	_____
19. ammonium carbonate	_____
20. antimony chloride	_____
21. potassium oxide	_____
22. ammonium sulfide	_____
23. mercuric nitrate	_____
24. iron(III) chloride	_____
25. aluminum oxide	_____

Corrected by _____

Chemistry Ion Chips Worksheet

Exercise 1: Compounds

A molecule is a particle that is formed from two or more atoms that are bound tightly together. Molecules behave as units in physical and chemical processes. The atomic composition of a substance is indicated by a chemical formula. In a formula, chemical symbols are used to indicate the types of atoms present, and subscripts are used to indicate the relative number of atoms of each type. If there is no subscript to the right of a symbol, it is understood that there is only one atom of this element. Thus, the formula H_2O indicates that a molecule of water contains two atoms of hydrogen and one atom of oxygen. In formulas with polyatomic ions (phosphate, sulfate or hydroxide, for example), parentheses are placed around the polyatomic ion, and the subscript is placed on the outside of the second parenthesis. Example: Calcium hydroxide is written as $Ca(OH)_2$. In molecules of elements, all of the atoms are of the same element. In molecules of compounds, however, the atoms contain two or more elements. The formula of a compound tells only the number and type of atoms present in a molecule of the compound.

For this exercise, fit your chips together to create electrically balanced compounds. Then, write the proper formula with coefficients and parentheses where necessary for each compound in the space provided.

- | | | | |
|-----------------------|---------------------|-----------|---------------------|
| 1. <u> KOH </u> | potassium hydroxide | 22. _____ | ammonia |
| 2. _____ | potassium chloride | 23. _____ | phosphoric acid |
| 3. _____ | potassium oxide | 24. _____ | iron (II) hydroxide |
| 4. _____ | potassium sulfate | 25. _____ | iron (II) chloride |
| 5. _____ | potassium nitride | 26. _____ | iron (II) oxide |
| 6. _____ | potassium phosphate | 27. _____ | iron (II) sulfate |
| 7. _____ | sodium hydroxide | 28. _____ | iron (II) nitride |
| 8. _____ | sodium chloride | 29. _____ | iron (II) phosphate |
| 9. _____ | sodium oxide | 30. _____ | magnesium hydroxide |
| 10. _____ | sodium sulfate | 31. _____ | magnesium chloride |
| 11. _____ | sodium nitride | 32. _____ | magnesium oxide |
| 12. _____ | sodium phosphate | 33. _____ | magnesium sulfate |
| 13. _____ | calcium hydroxide | 34. _____ | magnesium nitride |
| 14. _____ | calcium chloride | 35. _____ | magnesium phosphate |
| 15. _____ | calcium oxide | 36. _____ | aluminum hydroxide |
| 16. _____ | calcium sulfate | 37. _____ | aluminum chloride |
| 17. _____ | calcium nitride | 38. _____ | aluminum nitride |
| 18. _____ | calcium phosphate | 39. _____ | aluminum phosphate |
| 19. _____ | water | 40. _____ | aluminum oxide |
| 20. _____ | hydrochloric acid | 41. _____ | aluminum sulfate |
| 21. _____ | sulfuric acid | | |

Name: _____

Hour: _____ Date: _____

Chemistry: Ions in Chemical Compounds

Complete the following table, being sure that the total charge on the resulting compound is zero.

<u>Ions</u>	Chloride Cl^{1-}	Hydroxide OH^{1-}	Nitrate NO_3^{1-}	Sulfate SO_4^{2-}	Sulfide S^{2-}	Carbonate CO_3^{2-}	Phosphate PO_4^{3-}
Hydrogen H^{1+}							
Sodium Na^{1+}							
Ammonium NH_4^{1+}							
Potassium K^{1+}							
Calcium Ca^{2+}							
Magnesium Mg^{2+}							
Aluminum Al^{3+}							
Ferrous Fe^{2+}							
Iron (II) Fe^{2+}							
Ferric Fe^{3+}							
Iron (III) Fe^{3+}							
Plumbous Pb^{2+}							
Stannic Sn^{4+}							
Copper (I) Cu^{1+}							
Cupric Cu^{2+}							

NAMING IONIC COMPOUNDS

Name _____

Name the following compounds using the Stock Naming

1. CaCO_3 _____
2. KCl _____
3. FeSO_4 _____
4. LiBr _____
5. MgCl_2 _____
6. FeCl_3 _____
7. $\text{Zn}_3(\text{PO}_4)_2$ _____
8. NH_4NO_3 _____
9. $\text{Al}(\text{OH})_3$ _____
10. $\text{CuC}_2\text{H}_3\text{O}_2$ _____
11. PbSO_3 _____
12. NaClO_3 _____
13. CaC_2O_4 _____
14. Fe_2O_3 _____
15. $(\text{NH}_4)_3\text{PO}_4$ _____
16. NaHSO_4 _____
17. Hg_2Cl_2 _____
18. $\text{Mg}(\text{NO}_2)_2$ _____
19. CuSO_4 _____
20. NaHCO_3 _____
21. NiBr_3 _____
22. $\text{Be}(\text{NO}_3)_2$ _____
23. ZnSO_4 _____
24. AuCl_3 _____
25. KMnO_4 _____

MOLECULAR COMPOUNDS

Name the following covalent compounds.

1. CO_2 _____
2. CO _____
3. SO_2 _____
4. SO_3 _____
5. N_2O _____
6. NO _____
7. N_2O_3 _____
8. NO_2 _____
9. N_2O_4 _____
10. N_2O_5 _____
11. PCl_3 _____
12. PCl_5 _____
13. NH_3 _____
14. SCl_6 _____
15. P_2O_5 _____
16. CCl_4 _____
17. SiO_2 _____
18. CS_2 _____
19. OF_2 _____
20. PBr_3 _____

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Chemistry: Ions in Chemical Formulas

Write the correct formula for the compound formed by each of the following pairs of ions.

- | | |
|---|-----------|
| 1. Na^{1+} F^{1-} | 1. _____ |
| 2. K^{1+} S^{2-} | 2. _____ |
| 3. Ni^{2+} SO_4^{2-} | 3. _____ |
| 4. Al^{3+} O^{2-} | 4. _____ |
| 5. Ca^{2+} ClO_3^{1-} | 5. _____ |
| 6. NH_4^{1+} P^{3-} | 6. _____ |
| 7. Cu^{1+} NO_3^{1-} | 7. _____ |
| 8. Cu^{2+} NO_3^{1-} | 8. _____ |
| 9. Pb^{4+} O^{2-} | 9. _____ |
| 10. Li^{1+} CO_3^{2-} | 10. _____ |

For each of the following compounds, write...

- A) the symbols of the ions in the compound, and
B) the number of each ion in one molecule of that compound.

- | | |
|--|-----------|
| 11. CaI_2 | 11. _____ |
| 12. Na_2CO_3 | 12. _____ |
| 13. $\text{Ga}(\text{ClO}_3)_3$ | 13. _____ |
| 14. CuF_2 | 14. _____ |
| 15. $(\text{NH}_4)_3\text{PO}_4$ | 15. _____ |
| 16. FeSO_4 | 16. _____ |
| 17. $\text{Mg}(\text{NO}_3)_2$ | 17. _____ |
| 18. NH_4NO_2 | 18. _____ |
| 19. $\text{KC}_2\text{H}_3\text{O}_2$ | 19. _____ |
| 20. $\text{Na}_2\text{Cr}_2\text{O}_7$ | 20. _____ |

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Chemistry: *Binary Compounds*

List the oxidation numbers (charges) for each of the following elements.

Ca	N	Br
Be	Ba	Fr
K	P	Al
Group 1	Group 2	Group 13
Group 15	Group 16	Group 17
Zn	Ag	Fe (III)

Write the formulas for the following binary compounds.

calcium oxide	beryllium chloride
sodium fluoride	potassium iodide
copper (II) chloride	aluminum chloride
iron (III) oxide	strontium oxide

Write the names of the following binary compounds.

Cr_2O_3	NaBr
PbI_2	HCl
Al_2O_3	BN
RbI	BaF_2
H_2S	NaCl