4Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Formula Worksheet 1

Date \_\_\_\_\_\_\_\_\_\_\_\_ Hour \_\_\_\_\_\_\_\_

Use the indicated elements to write the formula for the compound in the first column (with oxidation numbers) and the name of the compound formed in the second column:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Elements | Formula | Name of Compound |
| 1 | Sodium, Sulfur |  |  |
| 2 | Calcium, Fluorine |  |  |
| 3 | Silver, Oxygen |  |  |
| 4 | Magnesium, Chlorine |  |  |
| 5 | Lithium, Nitrogen |  |  |
| 6 | Strontium, Sulfur |  |  |
| 7 | Barium, Bromine |  |  |
| 8 | Potassium, Oxygen |  |  |
| 9 | Francium, Iodine |  |  |
| 10 | Copper (II), Sulfur |  |  |
| 11 | Copper (I), Sulfur |  |  |
| 12 | Iron (II), Oxygen |  |  |
| 13 | Iron (III) Oxygen |  |  |
| 14 | Aluminum, Chlorine |  |  |
| 15 | Aluminum, Sulfur |  |  |
| 16 | Ammonium, Sulfur |  |  |
| 17 | Copper (II), Nitrate |  |  |
| 18 | Calcium, Phosphate |  |  |
| 19 | Potassium, Chlorine |  |  |
| 20 | Hydrogen, Oxygen |  |  |
| 21 | Calcium, Chlorine |  |  |
| 22 | Lead (II), Oxygen |  |  |
| 23 | Magnesium, Oxygen |  |  |
| 24 | Sodium, Hydroxide |  |  |
| 25 | Ammonium, Sulfate |  |  |
| 26 | Zinc, Acetate |  |  |
| 27 | Barium, Chlorate |  |  |

ANSWER KEY Formula Worksheet 1

Write the formula for the compound in the first column (with oxidation numbers) and the name of the compound formed containing the following elements:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Elements | Formula | Name of Compound |
| 1 | Sodium, Sulfur | Na2+1S-2 | Sodium sulfide |
| 2 | Calcium, Fluorine | Ca+2F2-1 | Calcium fluoride |
| 3 | Silver, Oxygen | Ag2+1O-2 | Silver oxide |
| 4 | Magnesium, Chlorine | Mg+2Cl2-1 | Magnesium chloride |
| 5 | Lithium, Nitrogen | Li3+1N-3 | Lithium nitride |
| 6 | Strontium, Sulfur | Sr+2S-2 | Strontium sulfide |
| 7 | Barium, Bromine | Ba+2Br2-1 | Barium bromide |
| 8 | Potassium, Oxygen | K2+1O-2 | Potassium oxide |
| 9 | Francium, Iodine | Fr+1I-1 | Francium iodide |
| 10 | Copper (II), Sulfur | Cu+2S-2 | Copper(II) sulfide, cupric sulfide |
| 11 | Copper (I), Sulfur | Cu2+1S-2 | Copper(I) sulfide, cuprous sulfide |
| 12 | Iron (II), Oxygen | Fe+2O-2 | Iron(II) oxide, Ferrous Oxide |
| 13 | Iron (III) Oxygen | Fe2+3O3-2 | Iron(III) oxide, Ferric Oxide |
| 14 | Aluminum, Chlorine | Al+3Cl3-1 | Aluminum chloride |
| 15 | Aluminum, Sulfur | Al2+3S3-2 | Aluminum sulfide |
| 16 | Ammonium, Sulfur | (NH4)2+1S-2 | Ammonium sulfide |
| 17 | Copper (II), Nitrate | Cu+2(NO3)2-1 | Copper(II) nitrate, cupric nitrate |
| 18 | Calcium, Phosphate | Ca3+2(PO4)2-3 | Calcium phosphate |
| 19 | Potassium, Chlorine | K+1Cl-1 | Potassium chloride |
| 20 | Hydrogen, Oxygen | H2+1O-2 | diHydrogen monoxide |
| 21 | Calcium, Chlorine | Ca+2Cl2-1 | Calcium chloride |
| 22 | Lead (II), Oxygen | Pb+2O-2 | Lead oxide |
| 23 | Magnesium, Oxygen | Mg+2O-2 | Magnesium oxide |
| 24 | Sodium, Hydroxide | Na+1(OH) -1 | Sodium hydroxide |
| 25 | Ammonium, Sulfate | (NH4)2+1(SO4)-2 | Ammonium sulfate |
| 26 | Zinc, Acetate | Zn+2(C2H3O2)2-1 | Zinc acetate |
| 27 | Barium, Chlorate | Ba+2(ClO3)2-1 | Barium chlorate |

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Formula Worksheet 2

Date \_\_\_\_\_\_\_\_\_\_\_\_ Hour \_\_\_\_\_\_\_\_

Use the indicated elements to write the formula for the compound in the first column (with oxidation numbers) and the name of the compound formed in the second column:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Elements | Formula | Name of Compound |
| 1 | Iron (+2), Sulfur |  |  |
| 2 | Calcium, Chlorine |  |  |
| 3 | Potassium, Sulfur |  |  |
| 4 | Barium, Bromine |  |  |
| 5 | Sodium, Sulfate |  |  |
| 6 | Copper (+2), Nitrate |  |  |
| 7 | Carbonate, Hydrogen |  |  |
| 8 | Ammonium, Hydroxide |  |  |
| 9 | Mercury (+2), Chlorine |  |  |
| 10 | Tin (+2), Sulfur |  |  |
| 11 | Strontium, Nitrate |  |  |
| 12 | Hydrogen, Sulfate |  |  |
| 13 | Iron (+3), Oxalate |  |  |
| 14 | Potassium, Oxygen |  |  |
| 15 | Copper (+1), Hydroxide |  |  |
| 16 | Sodium, Nitrogen |  |  |
| 17 | Cesium, Bromine |  |  |
| 18 | Nitrogen (+3), Oxygen |  |  |
| 19 | N (+5), Oxygen |  |  |
| 20 | Carbon (+2), Oxygen |  |  |
| 21 | \*Mercury (+1) Chlorine |  |  |
| 22 | Carbon (+4), Sulfur |  |  |
| 23 | Barium, Sulfite |  |  |
| 24 | Aluminum, Hypochlorite |  |  |
| 25 | Potassium, Manganate |  |  |
| 26 | Silver (+1), Chromate |  |  |
| 27 |  |  |  |

\*Mercury (I) does not bond 1:1 … similar to hydrogen peroxide (H2O2)

ANSWER KEY Formula Worksheet 2

Use the indicated elements to write the formula for the compound in the first column (with oxidation numbers) and the name of the compound formed in the second column:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Elements | Formula | Name of Compound |
| 1 | Iron (+2), Sulfur | Fe+2S-2 | Iron(II) sulfide (ferrous) |
| 2 | Calcium, Chlorine | Ca+2Cl2-1 | Calcium chloride |
| 3 | Potassium, Sulfur | K2+1S-2 | Potassium sulfide |
| 4 | Barium, Bromine | Ba+2Br2-1 | Barium bromide |
| 5 | Sodium, Sulfate | Na2+1(SO4)-2 | Sodium sulfate |
| 6 | Copper (+2), Nitrate | Cu+2(NO3)2-1 | Copper(II) nitrate (cupric) |
| 7 | Carbonate, Hydrogen | H2+1(CO3)-2 | Hydrogen carbonate (Carbonic Acid) |
| 8 | Ammonium, Hydroxide | (NH4) +1(OH)-1 | Ammonium hydroxide |
| 9 | Mercury (+2), Chlorine | Hg+2Cl2-1 | Mercury(II) chloride (mercuric) |
| 10 | Tin (+2), Sulfur | Sn+2S-2 | Tin(II) sulfide (stannous) |
| 11 | Strontium, Nitrate | Sr+2(NO3)2-1 | Strontium nitrate |
| 12 | Hydrogen, Sulfate | H2+1(SO4)-2 | Hydrogen sulfate (Sulfuric Acid) |
| 13 | Iron (+3), Oxalate | Fe2+3(C2O4)3-2 | Iron(III) oxalate (ferric) |
| 14 | Potassium, Oxygen | K2+1O-2 | Potassium oxide |
| 15 | Copper (+1), Hydroxide | Cu+1(OH)-1 | Copper(I) hydroxide (cuprous) |
| 16 | Sodium, Nitrogen | Na3+1N-3 | Sodium nitride |
| 17 | Cesium, Bromine | Cs+1Br-1 | Cesium bromide |
| 18 | Nitrogen (+3), Oxygen | N2+3O3-2 | Nitrogen(III) oxide (di-nitrogen tri-oxide) |
| 19 | N (+5), Oxygen | N2+5O5-2 | Nitrogen(V) oxide (di-nitrogen pent-oxide) |
| 20 | Carbon (+2), Oxygen | C+2O-2 | Carbon(II) oxide (mono-carbon mon-oxide) |
| 21 | Mercury (+1) Chlorine | \*Hg2+1Cl2-1 | Mercury(I) chloride |
| 22 | Carbon(+4), Sulfur | C+4S2-2 | CarbonIV sulfide |
| 23 | Barium, Sulfite | Ba+2(SO3)-2 | Barium sulfite |
| 24 | Aluminum, Hypochlorite | Al+3(ClO)3-1 | Aluminum hypochlorite |
| 25 | Potassium, Manganate | K2+1(MnO4)-2 | Potassium manganate |
| 26 | Silver (+1), Chromate | Ag2+1(CrO4)-2 | Silver chromate |
| 27 |  |  |  |

\*Mercury (I) does not bond 1:1 … similar to hydrogen peroxide (H2O2)

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Formula Worksheet 3

Date \_\_\_\_\_\_\_\_\_\_\_\_ Hour \_\_\_\_\_\_\_\_

From the compounds listed, give the formula including oxidation numbers. -ous is the first oxidation listed; -ic is the second oxidation listed.

|  |  |  |
| --- | --- | --- |
|  | Compound | Formula |
| 1 | Potassium bromide |  |
| 2 | Calcium nitrate |  |
| 3 | Cuprous (cu) sulfide |  |
| 4 | Sodium phosphate |  |
| 5 | Magnesium oxide |  |
| 6 | Francium chloride |  |
| 7 | Hydrogen bromide |  |
| 8 | Ferric (Fe) cyanide |  |
| 9 | Mercuric sulfate |  |
| 10 | Cesium sulfate |  |
| 11 | Sodium carbonate |  |
| 12 | Ammonium hydroxide |  |
| 13 | Ammonium sulfite |  |
| 14 | Potassium nitride |  |
| 15 | Stannic (Sn) oxide |  |
| 16 | Potassium chromate |  |
| 17 | Ferric (Fe) sulfide |  |
| 18 | Barium acetate |  |
| 19 | Calcium hydroxide |  |
| 20 | Zinc phosphate |  |
| 21 | Sodium bromide |  |
| 22 | Cuprous (cu) chlorate |  |
| 23 | Nitric acid |  |
| 24 | Nitrogen dioxide |  |
| 25 | Mercurous bromide |  |
| 26 | Hydrogen peroxide |  |
| 27 | Potassium hydroxide |  |

\*Mercury (I) does not bond 1:1 … similar to hydrogen peroxide (H2O2)

ANSWER KEY Formula Worksheet 3

From the compounds listed, give the formula including oxidation numbers. -ous is the first oxidation listed; -ic is the second oxidation listed.

|  |  |  |
| --- | --- | --- |
|  | Compound | Formula |
| 1 | Potassium bromide | K+1Br-1 |
| 2 | Calcium nitrate | Ca+2(NO3)2-1 |
| 3 | Cuprous sulfide copper I sulfide | Cu2+1S-2 |
| 4 | Sodium phosphate | Na3+1(PO4)-3 |
| 5 | Magnesium oxide | Mg+2O-2 |
| 6 | Francium chloride | Fr+1Cl-1 |
| 7 | Hydrogen bromide | H+1Br-1 |
| 8 | Ferric cyanide IronIII cyanide | Fe+3(CN)3-1 |
| 9 | Mercuric sulfate MercuryII sulfate | Hg+2(SO4)-2 |
| 10 | Cesium sulfate | Cs2+1(SO4)-2 |
| 11 | Sodium carbonate | Na2+1(CO3)-1 |
| 12 | Ammonium hydroxide | (NH4)+1(OH)-1 |
| 13 | Ammonium sulfite | (NH4)2+1(SO3)-2 |
| 14 | Potassium nitride | K3+1N-3 |
| 15 | Stannic oxide TinIV oxide | Sn+4O2-2 |
| 16 | Potassium chromate | K2+1(CrO4)-2 |
| 17 | Ferric sulfide IronIII sulfide | Fe2+3S3-2 |
| 18 | Barium acetate | Ba+2(C2H3O2)2-1 |
| 19 | Calcium hydroxide | Ca+2(OH)2-1 |
| 20 | Zinc phosphate | Zn3+1(PO4)2-3 |
| 21 | Sodium bromide | Na+1Br-1 |
| 22 | Cuprous chlorate copperI chlorate | Cu+1(ClO3)-1 |
| 23 | Nitric acid | H+1(NO3)-1 |
| 24 | Nitrogen dioxide | N+4O2-2 |
| 25 | Mercurous bromide | Hg2+1Br2-1 |
| 26 | Hydrogen peroxide | H2+1O2-1 |
| 27 | Potassium hydroxide | K+1(OH)-1 |

\*Mercury (I) does not bond 1:1 … similar to hydrogen peroxide (H2O2)

The simplest acids contain Hydrogen and contain only 2 elements. These are called **\_\_\_\_\_** acids.

Name the following binary acids:

|  |  |  |
| --- | --- | --- |
| Formula | Solid or Dry gas | Aqueous |
| HCl |  |  |
| HI |  |  |
| HF |  |  |
| H2S |  |  |

Name the oxyacid series for Chlorate and Nitrate:

|  |  |  |  |
| --- | --- | --- | --- |
| Dry or Gaseous State | Name | Aqueous State | Name |
|  |  |  |  |
| H2SO4 |  | HSO4 (aq) |  |
|  |  |  |  |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Dry or Gaseous State | Name | Aqueous State | Name |
|  |  |  |  |
| HNO3 |  | HNO3 (aq) |  |
|  |  |  |  |
|  |  |  |  |

|  |  |
| --- | --- |
| **Formula** | **Base Name** |
| NaOH |  |
| KOH |  |
| Ca(OH)2 |  |

The simplest acids contain Hydrogen and contain only 2 elements. These are called **binary** acids.

Name the following binary acids:

|  |  |  |
| --- | --- | --- |
| Formula | Solid or Dry gas | Aqueous |
| HCl | Hydrogen Chloride | Hydrochloric acid |
| HI | Hydrogen Iodide | Hydroiodic acid |
| HF | Hydrogen Fluoride | Hydrofluoric acid |
| H2S | Hydrogen Sulfide | Hydrosulfuric acid |

Name the oxyacid series for Chlorate and Nitrate:

|  |  |  |  |
| --- | --- | --- | --- |
| Dry or Gaseous State | Name | Aqueous State | Name |
| H2SO5 | Hydrogen persulfate | HSO5 (aq) | PerSulfuric Acid |
| H2SO4 | Hydrogen Sulfate | HSO4 (aq) | Sulfuric Acid |
| H2SO3 | Hydrogen Sulfite | HSO3 (aq) | Sulfurous Acid |
| H2SO2 | Hydrogen hypoSulfite | HSO2 (aq) | HypoSulfurous Acid |

|  |  |  |  |
| --- | --- | --- | --- |
| Dry or Gaseous State | Name | Aqueous State | Name |
| HNO4 | Hydrogen pernitrate | HNO4 (aq) | Pernitric Acid |
| HNO3 | Hydrogen Nitrate | HNO3 (aq) | Nitric Acid |
| HNO2 | Hydrogen Nitrite | HNO2 (aq) | Nitrous Acid |
| HNO | Hydrogen hypoNitrite | HNO (aq) | HypoNitrous Acid |

|  |  |
| --- | --- |
| **Formula** | **Base Name** |
| NaOH | Sodium hydroxide |
| KOH | Potassium hydroxide |
| Ca(OH)2 | Calcium hydroxide |

The compound iron(III) oxide, also known as rust, a 132 g sample of the compound composed of iron and oxygen contains 40 g of oxygen. What is the mass ratio and formula of iron(III) oxide? What law relates to the mass ratio of elements in a compound?

Two compounds contain only tin and chlorine. The ratio of the masses of chlorine combined with 1.00 g of tin in the two compounds is 2:1. If one compound has the formula SnCl2, what is the formula for the other compound?

The compound iron(III) oxide, also known as rust, a 132 g sample of the compound composed of iron and oxygen contains 40 g of oxygen. What is the mass ratio and formula of iron(III) oxide? What law relates to the mass ratio of elements in a compound?

**Iron 🡪 132 g – 40 g = 92 g**

**Law of definite proportions: Mass Fe / mass oxygen = 92 g / 40 g = 7:3 = 2.3 : 1**

**Fe2+3O3-2  (use criss-cross rule) … law of definite proportions**

Two compounds contain only tin and chlorine. The ratio of the masses of chlorine combined with 1.00 g of tin in the two compounds is 2:1. If one compound has the formula SnCl2, what is the formula for the other compound? What law relates to the mass ratio of elements in different compound?

**Law of multiple proportions. The problem compares the masses of CHLORINE between the two compounds … with a ratio of 2:1. Therefore, multiply the chlorine by 2.**

**SnCl4 … law of multiple proportions**