Using the Lewis-Dot diagram, illustrate how the compounds form. Use ‘x’ for the valence electrons of metals.

**WE WENT OVER THESE IN CLASS.**

|  |  |  |  |
| --- | --- | --- | --- |
| Na + Cl | K + I | Mg + Cl | Li + N |
|  |  |  |  |

What is the electron dot structure for a compound of

potassium and chlorine?

Draw a Lewis electron dot diagram for an O2- ion.

List the properties of an IONIC BOND

1. ELECTROLYTE
2. HIGH ELECTRONEGATIVITY DIFFERENCE
3. CRYSTAL STRUCTURE = BRITTLE!!
4. SALTS
5. SOLIDS AT ROOM TEMPERATURE
6. DISSOLVE EASILY IN WATER
7. HIGH MELTING AND BOILING POINT

List the properties of a METALLIC BOND

1. CONDUCTOR OF HEAT AND ELECTRICITY
2. MALLEABLE
3. DUCTILE

-What particle of the atom is responsible for these properties? \_\_ELECTRONS - VALENCE\_\_\_\_\_\_\_

To form an Ionic bond, you need a \_METAL (CATION) (+)\_\_\_\_\_\_ and \_\_NONMETAL (ANION) (-)\_\_\_\_\_\_\_\_\_\_\_.

Elements in group 1A most likely bond in a 2:1 ratio with elements from group \_\_\_6A\_\_\_.

When an ionic bond is formed the atom that gains valence electrons becomes a(n) **(cation, anion)** with a **(positive, negative**) charge and (**more, the same, less**) protons.

IONIC NAMING, COMPLETE THE CHART

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| CATION | OXIDATION # | ANION | OXIDATION # | FORMULA | NAME |
| Lithium | 1 | Carbonate | 2- | Li2CO3 | Lithium Carbonate |
| Iron (III) | 3 | Cyanide | 1- | Fe(CN)3 | Iron (III) Cyanide |
| Copper (I) | 1 | Bromine | 1- | CuBr | Copper (I) Bromide |
| Silver | 1 | Sulfur | 2- | Ag2S | Silver Sulfide |
| Magnesium | 2 | Iodine | 1- | MgI2 | Magnesium Iodide |

A compound formed between element Q and phosphorus makes the formula, Q3P. What element is the unknown Q?

1. Nitrogen b. Lithium c. Chlorine d. Oxygen

Given unknown metal X, and the formula, X2O, how many valence electrons does the unknown metal have?

1. 6 b. 3 c. 2 d. 1

What do the roman numerals in a compound represent? \_\_\_OXIDATION NUMBERS\_\_\_\_\_\_\_\_\_\_\_

Complete the table below on % Composition of compounds

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| FORMULA | ELEMENTS IN COMPOUND | # OF EACH ELEMENT | TOTAL # OF ATOMS | MASS OF EACH ELEMENT | MOLAR MASS OF COMPOUND | % COMPOSITION OF ELEMENT LISTED |
| MgBr2 | Mg  Br | 1  2 | 3 | 24.305  79.904 | 184.113 | **Br**  **86.80%** |
| Na3PO4 | Na  P  O | 3  1  4 | 8 | 22.990  30.974  15.999 | 163.94 | **O**  **39.04%** |
| (NH4)3PO4 | N  H  P  O | 3  12  1  4 | 20 | 14.007  1.008  30.974  15.999 | 149.087 | **H**  **8.11%** |
| Ni3(PO4)2 | Ni  P  O | 3  2  8 | 13 | 58.693  30.974  15.999 | 366.019 | **Ni**  **48.11%** |

Explain how you would name a BINARY IONIC SALT.

METAL CATION NAME STAYS THE SAME, NONMETAL ANION END CHANGES TO ‘IDE’

BROMIDE, SULFIDE, PHOSPHIDE, NITRIDE, OXIDE, CHLORIDE, FLUORIDE, IODIDE

Explain how you would name TERNARY IONIC SALT.

METAL CATION NAME STAYS THE SAME, THE POLYATOMIC ION NAME STAYS THE SAME. (METAL IS LIKE FIRST NAME, POLYATOMIC IS LIKE LAST NAME – LITHIUM CARBONATE)

IF POLYATOMIC ION IS AMMONIA, AMMONIA STAYS THE SAME AND THE ANION WILL CHANGE TO HAVE ‘IDE’ AT END OF ANION NAME.

Explain how you would name a SALT WITH MULTIPLE OXIDATION #’S.

METAL CATION NAME STAYS THE SAME, AFTER THE NAME PUT (WITH ROMAN NUMERALS INSIDE) THEN FOLLOW BINARY OR TERNARY SALT NAMING RULES

Explain how you would name a BINARY ACID.

H + NONMETAL

HYDRO\_\_\_\_\_\_\_\_\_IC ACID EX: HYDROBROMIC ACID

Explain how you would name a TERNARY ACID.

H + POLYATOMIC ION

“ATE” ENDING – CHANGE TO “IC” AND THEN ADD ACID

“ITE” ENDING – CHANGE TO “OUS” AND THEN ADD ACID

Explain how you would name a BASE.

CATION + OH

KEEP THE METAL NAME THE SAME AND ADD HYDROXIDE TO THE END

What makes a compound a BASE?

OH-

Use the EN values to answer the following three questions:

1. Will sodium and oxygen form an ionic bond? ( Y, N)
2. Will aluminum and phosphorus form an ionic bond?

(Y, N)

1. Will calcium and selenium form an ionic bond? (Y,N)

|  |  |
| --- | --- |
| **Element** | **EN value** |
| Sodium | 0.93 |
| Calcium | 1.00 |
| Aluminum | 1.61 |
| Oxygen | 3.44 |
| Selenium | 2.58 |
| Phosphorus | 2.19 |

What is the empirical formula of a compound with 0.966 moles of hydrogen, 0.322 moles of phosphorous, and 1.288 moles of oxygen?

H = 0.966 MOLES/0.322 MOLES = 3

P = 0.322 MOLES/0.322 MOLES = 1

O = 1.288 MOLES/0.322 MOLES = 4

RATIO = 3:1:4

FORMULA = H3PO4

NAME = HYDROPHOSPHORIC ACID

What is the empirical formula of a compound with 1.4 grams of lithium, 1.2 grams of carbon, and 4.8 grams of oxygen?

LITHIUM = 1.4 GRAMS/6.941 GRAMS/MOLES = 0.2 MOLES/0.1 MOLES = 2

CARBON = 1.2 GRAMS/12.011 GRAMS/MOLES = 0.1 MOLES/0.1 MOLES = 1

OXYGEN = 4.8 GRAMS/15.999 GRAMS/MOLES = 0.3 MOLES/0.1 MOLES = 3

RATIO: 2:1:3

FORMULA = Li2CO3

**K ONLY**

**Using the table, determine either the name or formula for the following hydrates. (on here, - is going to be the dot)**

|  |  |
| --- | --- |
| **Formula** | **Name** |
| **Cs2CO2 ∙ 2H2O** | **CESIUM CARBONITE DIHYDRATE**  **(\*IF YOU PUT CARBON DIOXIDE FOR C02 THAT IS OK)** |
| **Li2SO4 – 10H20** | **Lithium sulfate decahydrate** |
| **Pb(OH)4 ∙ 7H2O** | **LEAD (IV) HYDROXIDE HEPTAHYDRATE** |
| **CaCO3 – 3H20** | **calcium carbonate trihydrate** |

**Using the table, write the prefix for the number listed.**

|  |  |
| --- | --- |
| **Prefix** | **Number** |
| **Mono** | **1** |
| **Di** | **2** |
| **Tri** | **3** |
| **Tetra** | **4** |
| **Penta** | **5** |
| **Hexa** | **6** |
| **Hepta** | **7** |
| **Octa** | **8** |
| **Nona** | **9** |
| **Deca** | **10** |

**TOPICS TO MAKE SURE YOU STUDY**

* **WRITING IONIC FORMULAS**
* **WRITING IONIC NAMES FROM FORMULAS**
* **DETERMINING IF A COMPOUND IS IONIC OR NOT**
* **LEWIS DOT DIAGRAMS**
* **% COMPOSITION**
* **EMPIRICAL FORMULAS**
* **NAMING ACIDS AND BASES**
* **HYDRATES**
* **METALLIC BOND PROPERTIES**
* **IONIC BOND PROPERTIES**