Sc9 Notes Chem Unit Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**IONIC COMPOUNDS WITH MULTI-VALENT METALS**

* Many important metals are **multivalent**
  + “multi” means *many*
  + “valent” refers to the *capacity to bond*
* Multivalent metals can form \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ions with different ion charges
  + *Ex:* **Iron** has 2 ion charges: **\_\_\_\_\_\_\_\_\_\_** and **\_\_\_\_\_\_\_\_\_\_**. It can exist as either.
* Periodic table shows the most **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** ion charge first
* Text

  Description automatically generatedWhen we’re talking about **multivalent metals (ONLY!)**, we need make sure we’re clear ***which   
  ion*** form we’re talking about. To do this, we use **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
  + We \_\_\_\_\_\_\_\_\_\_\_\_\_\_ use Roman Numerals for copper (Cu) because it can have a charge   
    of either 2+ or 1+ as an ion, and we’d need to specify which one
  + Text

    Description automatically generatedWe \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ use Roman Numerals for calcium (Ca) because it always has a   
    charge of 2+ as an ion

*Table

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*Examples*

Fe3+ - Written: **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** ; pronounced : “iron three” ; means the iron ion has a charge of 3+

Fe2+ - Written: **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** ; pronounced : “iron two” and means the iron ion has a charge of 2+

Pb4+ - Written: **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** ; pronounced : “lead four” and means the lead ion has a charge of 4+

Cu+ - Written: **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** ; pronounced : “copper one” and means the copper ion has a charge of 1+

**Writing Chemical Formulas with Multivalent Metals**

* The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ after the metal will tell you which ion charge to use
  + Example: chromium(III) fluoride 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***Examples*: Write the chemical formulas of the following compounds**

|  |  |
| --- | --- |
| * copper(I) iodide 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ * tin(II) nitride 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | * iron(II) phosphide 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_ * tin(IV) nitride 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

**Naming Compounds with Multivalent Metals**

* It’s important EVERY time you write the metal in the compound, you stop to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ if it’s multivalent!!
  + If it **IS**, you need to include the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
  + If it **IS NOT** multivalent, **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** include Roman Numeral!

**Examples: Write the name of the following compounds**

|  |
| --- |
| * Cu3P 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ * MnO2  🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |