Notes: Particle Model

# Recall – Dalton Model

How did Dalton represent the atom?

Remember: Dalton said that atoms were \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

We now know that this is an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_version of the atom

**BUT**

Very practical for a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of atoms in chemical formulas!

We also often call this the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Using the Dalton model (particle model), how could we represent different atoms?**

1. We can use different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. We can use different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. We can use different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. We can use different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Recall – Atoms vs Molecules

What is the difference between an atom and a molecule?

This is just a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; they are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Now this is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_because they are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_!

The molecular formula is: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Counting Atoms

When looking at a chemical equation (containing chemical formulas) it is important to be able to determine how many atoms there are of each element involved

* This number will depend on:

2Cu(NO3)2

* + The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (numbers in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (numbers at the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)
* **Coefficients:**
  + Tell you \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_there are as a whole
* **Subscripts**
  + Tell you \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ there are in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Practice

**How would you represent the following?**

|  |  |  |  |
| --- | --- | --- | --- |
| **Na** | **2 Na** | **2 H2** | **H2SO4** |
|  |  |  |  |

Cu(NO3)2

|  |
| --- |
|  |

2Cu(NO3)2

|  |
| --- |
|  |

Ca3(PO4)2

|  |
| --- |
|  |

3 Ca3(PO4)2

|  |
| --- |
|  |

# Counting Atoms

Drawing the atoms/molecules can be very time consuming

As we move on to balancing equations, it will be easier just to count how many atoms of each element are present!

Just like in math, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that comes after them

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_only multiply the atom(s) they \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* This included \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_!

# Practice

**How many atoms of each element are present in the following?**

|  |  |  |  |
| --- | --- | --- | --- |
| **NaCl** | **2 NaCl** | **Na2SO4** | **2 Na2SO4** |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **3 CuSO4** | **C5H11OH** | **3 C5H11OH** | **Ca3(PO4)2** |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **3 Ca3(PO4)2** | **Cu(NO3)2** | **2 Cu(NO3)2** | **3 NH4Cl** |
|  |  |  |  |

We can apply the same idea to whole chemical equations

4 Al + 3 O2 ⇒ 2 Al2O3

Fe2O3  + 3 CO ⇒ 2 Fe + 3 CO2