

## Chemistry - The Mole

### Hydrates and Formulas

**Definition:** A hydrate is a chemical compound that contains water molecules bound to its crystal structure.

Use of prefixes notes the number of water molecules.

Percent composition in a hydrate:

Calculate the percent water in the chemical formula for calcium chloride dihydrate, written as  $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$

You try this one:

What is the percent water found in the compound copper (II) sulfate pentahydrate,  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ ?

Now, working backwards, determine the formula of a hydrate

Example:

A 5.0 gram sample of copper (II) sulfate in its hydrated form contained 36% by mass water. What is the formula for the hydrated copper (II) sulfate?

Example:

11.75 grams of a cobalt (II) chloride hydrate is heated and 9.25 grams of the anhydrous cobalt (II) chloride was recovered. What is the formula and name for the compound?

Try this one on your own:

Magnesium sulfate in its hydrated form is 51.2% water. What is the formula and name of its hydrate?