



Formula of a Hydrate

Lab #11

Many ionic compounds trap water molecules inside their structure when they form. These water molecules are called waters of hydration. For instance cobalt II sulfate forms so that there are 3 water molecules for each CoSO_4 . This formula is written $\text{CoSO}_4 \cdot 3\text{H}_2\text{O}$, and is called cobalt II sulfate trihydrate.

In this lab you will be determining the correct formula, including the number of waters of hydration in copper II sulfate.

Materials:

Crucible and cover	clay triangle	ring and ring stand	burner
Striker	balance	hydrated copper II sulfate	

Procedure:

Obtain a crucible and cover and clean them out to the best of your ability. Place the crucible and cover on a clay triangle on a ring stand and heat them, gently at first, until they are red hot. Allow them to cool and then weigh them.

Place enough copper sulfate in the crucible to cover the bottom. Reweigh the crucible and cover with the copper sulfate in the crucible. **Gently** heat the crucible and cover until the color change in the copper sulfate is complete. Allow the crucible to cool and reweigh. Reheat, cool and reweigh until you get consistent masses (within 0.02 of each other). Discard the dehydrated crystals.

Calculations:

Determine the mass of hydrated copper II sulfate and the mass of water driven off.

Determine the percent of water in the hydrated compound

Use an Empirical Formula style calculation to determine the formula of the hydrated compound.