

Summary of Hydrate Lab Calculations

1. Mass of Magnesium Sulfate Heptahydrate sample in the evaporating dish (Weighing by Difference): This is a subtraction

$$\begin{aligned} & \text{Mass of Evaporating Dish + Watch Glass + Magnesium Sulfate Heptahydrate} \\ & - \text{Mass of Evaporating Dish + Watch Glass} \\ & \text{Mass of your Magnesium Sulfate Heptahydrate sample} \end{aligned}$$



2. Theoretical percent of water in copper (II) pentahydrate:

Determine Molar Mass of MgSO_4
Determine Molar Mass of 7 H_2O

$$\frac{\text{Molar Mass 7 Waters}}{\text{Molar Mass 7 Waters + Molar Mass MgSO}_4} \times 100 = \text{Theoretical Water \% Magnesium Sulfate Heptahydrate}$$

3. Theoretical yield (weight loss after heating) of water in your $\text{MgSO}_4 \cdot \text{H}_2\text{O}$ sample:

$$\text{Magnesium Sulfate Heptahydrate} \times \text{Theoretical Water \%} = \text{Theoretical amount of water lost when heated}$$



Your mass $\text{MgSO}_4 \cdot 7 \text{H}_2\text{O}$ in evaporating dish at start of lab

4. Mass of MgSO_4 remaining in the evaporating dish after heating (Weighing by Difference):

$$\begin{aligned} & \text{Mass of Evaporating Dish + Watch Glass + Magnesium sulfate} \\ & - \text{Mass of Evaporating Dish + Watch Glass} \\ & \text{Mass of your Magnesium Sulfate sample remaining at end of experiment} \end{aligned}$$

5. Mass of Water Lost (Weighing by Difference):

$$\begin{aligned} & \text{Mass of your Magnesium Sulfate heptahydrate sample at beginning of experiment} \\ & - \text{Mass of your Magnesium Sulfate sample remaining at end of experiment} \\ & \text{Mass of water Lost} \end{aligned}$$

6. Experimental Percent of water in Magnesium Sulfate Heptahydrate:

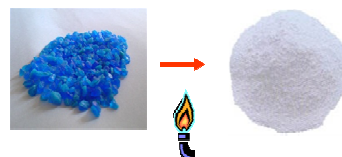
$$\frac{\text{Mass of water lost (g)}}{\text{Mass hydrate (before heating) (g)}} \times 100 = \text{Experimental Percent of water in Magnesium Sulfate Heptahydrate}$$

7. Determine n in $\text{MgSO}_4 \cdot n \text{H}_2\text{O}$ (n is ratio of water to anhydrous Magnesium Sulfate):

$$\text{H}_2\text{O lost (g)} \times \frac{\text{mole}}{\text{Molar Mass H}_2\text{O g}} = \text{moles H}_2\text{O lost}$$

$$\text{MgSO}_4 \text{ remaining (g)} \times \frac{\text{mole}}{\text{Molar Mass MgSO}_4 \text{ g}} = \text{moles MgSO}_4 \text{ remaining}$$

Your mass MgSO_4 in evaporating dish at end of experiment



$$(n) = \frac{\text{Moles H}_2\text{O lost}}{\text{Moles MgSO}_4 \text{ remaining}}$$