Summary of Hydrate Lab Calculations

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

Mass of Evaporating Dish + Watch Glass + Magnesium Sulfate Heptahydrate
- Mass of Evaporating Dish + Watch Glass
Mass of your Magnesium Sulfate Heptahydrate sample

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

Determine Molar Mass of $MgSO_4$

Determine Molar Mass of 7 H_2O

$$\frac{\text{Molar Mass 7 Waters}}{\text{Molar Mass 7 Waters + Molar Mass } MgSO_4} \times 100 = \textbf{Theoretical Water \%}$$ Magnesium Sulfate Heptahydrate

3. Theoretical yield (weight loss after heating) of water in your $MgSO_4 \cdot H_2O$ sample:

Magnesium Sulfate Heptahydrate x **Theoretical Water %** = Theoretical amount of water lost when heated

Your mass $MgSO_4 \cdot 7\ H_2O$ in evaporating dish at start of lab

4. Mass of $MgSO_4$ remaining in the evaporating dish after heating (Weighing by Difference):
Mass of Evaporating Dish + Watch Glass + Magnesium sulfate
- Mass of Evaporating Dish + Watch Glass
Mass of your Magnesium Sulfate sample remaining at end of experiment

5. Mass of Water Lost (Weighing by Difference):
Mass of your Magnesium Sulfate heptahydrate sample at beginning of experiment
- Mass of your Magnesium Sulfate sample remaining at end of experiment
Mass of water Lost

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 $MgSO_4 \cdot n\ H_2O$ (n is ratio of water to anhydrous Magnesium Sulfate):

H_2O lost (g) x $\frac{\text{mole}}{\text{Molar Mass } H_2O \text{ g}}$ = moles H_2O lost

$MgSO_4$ remaining (g) x $\frac{\text{mole}}{\text{Molar Mass } MgSO_4 \text{ g}}$ = moles $MgSO_4$ remaining

Your mass $MgSO_4$ in evaporating dish at end of experiment

(n) = $\frac{\text{Moles } H_2O \text{ lost}}{\text{Moles } MgSO_4 \text{ remaining}}$