#80061 Chemistry, Other

A sample of $MgCO_3 \bullet 3H_20$ (magnesium carbonate trihydrate) is heated until 40.37 g of water are released. How many grams did the original hydrate weigh?

Answer:

When a hydrate salt is heated water is released and anhydrous salt is formed.
The balanced chemical equation for the reaction is

$$MgCO_3 \cdot 3\ H_2O \rightarrow MgCO_3 + 3\ H_2O$$

M ($MgCO_3 \cdot 3\ H_2O$) = 138 g/mol
M (H_2O) = 18 g/mol
From the balanced chemical equation: 3 H_2O is released from 1 $MgCO_3 \cdot 3\ H_2O$.
3 x 18 g of H_2O is released from 138 g of $MgCO_3 \cdot 3\ H_2O$.
40.37 g of H_2O is released from 138 x 40.37 / (3 x 18) = 103.168 g of $MgCO_3 \cdot 3\ H_2O$