Answer on Question #54890 – Chemistry – Inorganic Chemistry

Question:

A student heated (1.30x10^0) grams of copper(II) sulfate pentahydrate and found the anhydrous salt weighed (7.5800x10^-1) grams. What was this student's experimental mass percent water?

Solution:

The mass percent of water is given by equation:

$$\omega = \frac{m_{H2O}}{m_{salt}} \cdot 100\%$$

Where

m_{H2O} - is the mass of water (6.626070040(81)×10^{-34}J·s),

m_{salt} - is the mass of hydrated salt

So as mass of hydrated salt is the sum of water mass and mass of anhydrous salt, we can find mass of lost water:

$$m_{H2O} = m_{CuSO4 \cdot 5H2O} - m_{CuSO4}$$

So, the mass percent of water is:

$$\omega = \frac{m_{CuSO4 \cdot 5H2O} - m_{CuSO4}}{m_{CuSO4 \cdot 5H2O}} \cdot 100\%$$

$$\omega = \frac{1.3 \cdot 10^0 - 7.58 \cdot 10^{-1}}{1.3 \cdot 10^0} \cdot 100\% = 41.69\%$$

Answer: $\omega = 41.69\%$