Answer on Question #84361 – Chemistry – Other

Task:

Determine the weight of Na_2SO_4 dissolved in 700 grams of water if the solution has a concentration of 54.5% by weight?

Solution:

Mass percentage is the number of parts of mass of solute per hundred parts by mass of solution. If m_x is the mass of solute X and m_s is the mass of solvent S, then

$$Mass\ \% = \frac{m_x}{m_x + m_s} * 100$$

Water (H_2O) is solvent.

Na_2SO_4 is solute.

Then,

$$Mass\ \% = \frac{m(Na_2SO_4)}{m(Na_2SO_4) + m(H_2O)} * 100;$$
$$Mass\ \% * [m(Na_2SO_4) + m(H_2O)] = m(Na_2SO_4) * 100;$$
$$54.5 * (x + 700) = x * 100;$$
$$54.5x + 38150 = 100x;$$
$$38150 = 100x - 54.5x;$$
$$38150 = 45.5x;$$
$$x = m(Na_2SO_4) = 838.46g$$

Answer: 838.46 grams of Na_2SO_4