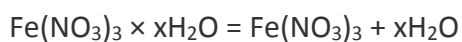


Answer on Question #55451 – Chemistry – General chemistry

Question:

A student takes 1.857g of hydrogen iron (III) nitrate and heats it in a crucible. the anhydrous material weighed 1.112g. what is the formula for the hydrated salt? show your work

Solution



$$\text{Mr}(\text{Fe}(\text{NO}_3)_3) = \text{Ar}(\text{Fe}) + \text{Ar}(\text{N}) \times 3 + \text{Ar}(\text{O}) \times 9 = 56 + 14 \times 3 + 16 \times 9 = 56 + 42 + 144 = 242$$

$$\text{Mr}(\text{H}_2\text{O}) = \text{Ar}(\text{H}) \times 2 + \text{Ar}(\text{O}) = 1 \times 2 + 16 = 18$$

$$n(\text{Fe}(\text{NO}_3)_3) = m/M = 1.112 / 242 = 0.0046 \text{ (mol)}$$

$$n(\text{H}_2\text{O}) = m/M = (1.857 - 1.112) / 18 = 0.0413 \text{ (mol)}$$

$$n(\text{H}_2\text{O}) = x \times n(\text{Fe}(\text{NO}_3)_3)$$

$$x = n(\text{H}_2\text{O}) / n(\text{Fe}(\text{NO}_3)_3) = 0.0413 / 0.0046 = 8.98 \sim 9$$

Answer: $\text{Fe}(\text{NO}_3)_3 \times 9\text{H}_2\text{O}$