Answer on Question#74889 – Chemistry – General chemistry

Question:

A solution of 0.64g of adrenaline in 36 g of carbon tetrachloride causes an elevation of 0.49 °C in the boiling point. What is the molar mass of the adrenaline? Show the solution.

Solution:

$$\Delta T_b = iK_b m$$

$$m = \frac{\Delta T_b}{iK_b} = \frac{0.49℃}{1 \times 5.02 \frac{℃}{m}} = 0.0976m = 0.0976 \frac{\text{moles adrenaline}}{1\ \text{kg carbon tetrachloride}}$$

$$n(\text{adrenaline}) = \frac{0.0976\ \text{mol} \times \frac{36\ \text{kg}}{1000}}{1\ \text{kg}} = 0.00351\ \text{mol}$$

$$M = \frac{0.64\ \text{g}}{0.00351\ \text{mol}} = 182.3 \frac{\text{g}}{\text{mol}}$$

Answer:

182.3 g/mol