

A 110. mL solution of 0.340 M HCl(aq) is mixed with a solution of 330. mL of 0.150 M HNO₃(aq). The solution is then diluted to a final volume of 1.00L. How many moles of H⁺ are present in the final solution?

Solution:

We determined the number moles of H⁺ in both solutions.

The number moles of H⁺ in HCl solution amount to number moles of HCl and equal is:

$$n(\text{H}^+) = 0.340 \cdot 0.110 = 0.0374 \text{ mol.}$$

The number moles of H⁺ in HNO₃ solution also amount to number moles of HNO₃ and equal is:

$$n(\text{H}^+) = 0.15 \cdot 0.330 = 0.0495 \text{ mol.}$$

The concentration of ion H⁺ which form during dissociation of water we disregard, because it is very small value ($1 \cdot 10^{-7}$ mol).

So, in the final solution the number moles of H⁺ are: $0.0374 + 0.0495 = 0.0869$ mol.

Answer:

The number moles of H⁺ are 0.0869.