Answer on Question #63422 - Chemistry - Other

Task:

What volume (in L) of 0.90% NaCl solution is needed to provide 4.7 g of NaCl? Assume the density of the solution is 1.0 g/mL. _____ L

Solution:

We find the weight of the NaCl solution:

$$m(solution\ NaCl) = \frac{m(NaCl) \times 100\%}{w(\%)};$$

$$m(solution\ NaCl) = \frac{4.7 \times 100\%}{0.90\%} = 522.22g;$$

We find the volume of the NaCl solution:

$$\rho = \frac{m}{V}; \quad \Rightarrow \quad V = \frac{m}{\rho};$$

$$V(solution\ NaCl) = \frac{m(solution\ NaCl)}{\rho};$$

$$V(solution\ NaCl) = \frac{522.22g}{1.0\,{}^{g}\!/_{ml}} = 522.22ml;$$

$$V(solution\ NaCl) = 522.22ml \approx 0.52L.$$

Answer: V (solution NaCl) = 0.52 L.