

## Answer on the question #56696 - Chemistry - General Chemistry

### Question:

How would you dilute a solution containing 0.5g in 100mL to give 0.5mg/mL

### Answer:

Concentration of the start solution is:

$$c_1 = \frac{m_1(\text{substance})}{V_1(\text{solution})} = \frac{0.5g}{100mL} = 5 \cdot 10^{-3} g/mL$$

To have the solution with the concentration of 0.5 mg/mL, or  $0.5 \cdot 10^{-3}$  g/mL we should dilute the initial solution 10 times.

Then, the final solution volume will be:

$$c_1 V_1 = c_2 V_2, \quad V_2 = \frac{c_1 V_1}{c_2} = \frac{5 \cdot 10^{-3} (g/mL) \cdot 100 (mL)}{0.5 \cdot 10^{-3} (g/mL)} = 1000 (mL), \text{ or } 1L$$

So, we take 100 mL of starting solution and get 1L of resulting solution, adding  $(1000-100)=900$  mL of pure water.