

Answer on Question#65276 – Chemistry – General chemistry

Question: you begin with a stock solution having a concentration of 2.20 M. Its absorbance is 0.88. you took 7.15 mL of the 2.20M solution and diluted it. Its absorbance is 0.605. What is the concentration of the new solution?

Solution:

$A = \epsilon lc$ – The Beer-Lambert Law, where A is absorbance; ϵ - molar absorptivity, l – length of solution the light passes through.

$\epsilon l = \text{const} = k$ – for the same experiment with the same substance

$$A = kc$$

$$A_1 = 0.88; c_1 = 2.2M$$

$$k = \frac{A}{c} = \frac{0.88}{2.20M} = 0.40M^{-1}$$

$$A_2 = 0.605; c_2 = \frac{A_2}{k} = \frac{0.605}{0.40M^{-1}} = 1.51M$$

Answer: 1.51 M – concentration of new solution.