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Generating and Using a Calibration Graph

Solution Dilution!

Now that you've taken absorbance spectra and plotted absorbance vs. wavelength, it's time to make a calibration graph, and plot absorbance vs. concentration. First though, you'll need solutions of different concentrations, and to do that, you need to make dilutions.

Dilution measurements use the equation:

$$M_1V_1 = M_2V_2$$

Where M_1 is the molarity of the first solution and M_2 is the molarity of the second, and V_1 and V_2 are the volumes.

This is actually a condensed equation of two molarity equations. Let's walk through how it comes to this.

You want to make a **50mL of a 0.03M solution**. You have a **0.1M solution**.

We can start with the Molarity Equation

$$M = \frac{\text{mols}}{\text{Liters}}$$

Start with what you want. You want 50mL of a 0.03M solution. You have a volume and a concentration so you can find how many moles of your compound will be in there. Try doing this!

[Scroll here to check your answer!](#)

Now that you know the number of moles you need, now you need to find a volume of your current solution, that has that many moles in it. Your

current solution is 0.1M So how many mL would you need, to have that many moles?

[Scroll here to check your answer!](#)

Now that you found how many mL of your stock solution you need, how many mL of water will you need to add?

[Scroll here to check your answer!](#)

That was the long way of doing this problem. You can also use the simplified equation of

$$M_1 V_1 = M_2 V_2$$

You want **50mL of a 0.03M** solution. You have a volume and a concentration for one of the solutions, so that will go on one side

$$M_1 = 0.03M$$

$$V_1 = 50mL$$

You also have the concentration of the other solution. You have a stock solution of **0.1M**

$$M_2 = 0.1M$$

$$(50mL)(0.03M) = (0.1M)V_2$$

$$1.5(M * mL) = (0.1M)V_2$$

$$\frac{1.5(M * mL)}{0.1M} = V_2$$

$$V_2 = 15mL$$