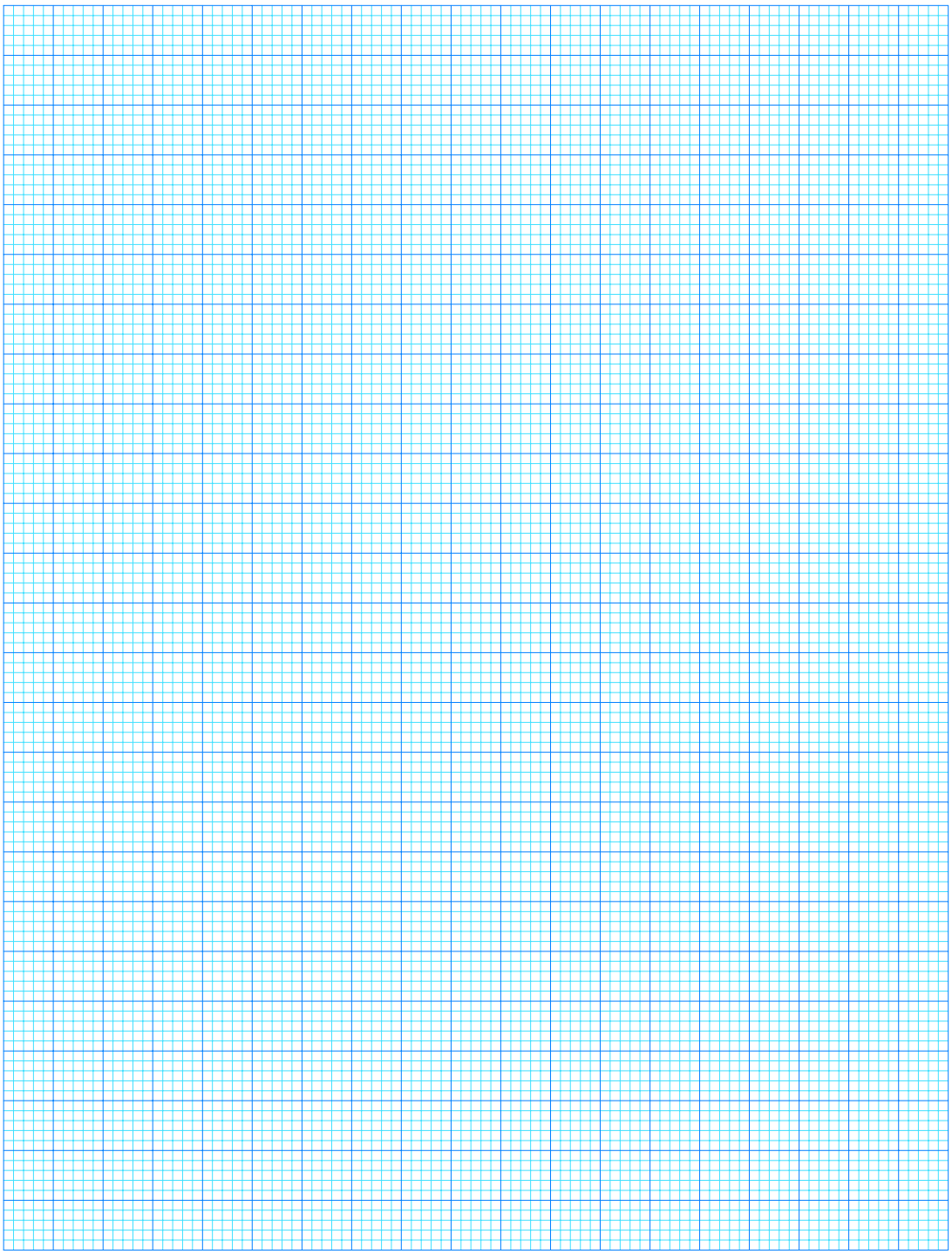
Spectrometry I: Calibration Graph

Flask #	I	II	III	IV	V
Fe conc [mg/mL] X 10^{-4}	_____	_____	_____	_____	_____
Transmittance [%T/100]	_____	_____	_____	_____	_____
Absorbance [-log(T)]	_____	_____	_____	_____	_____



Spectrometry II: Determination of Iron in Scooby Vitamin Pill

If solution B2 is made by diluting 10.0 mL of A to the 100.0 mL mark and C2 is made by diluting 15.0 mL of B2 to the 100.0 mL mark, the tablet content of solution C2 is:
Aliquot of A = [1.00 tablet/100 mL] X 10.0 mL = **0.100 tablet or 1.00 X 10^{-3} tablet/mL**
Aliquot of B2 = [**1.00 X 10^{-3} tablet/mL**] X 15.0 mL = **1.50 X 10^{-2} tablet**
Concentration of C2 = [**1.50 X 10^{-2} tablet**] / 100.0 mL = **1.50 X 10^{-4} tablet/mL**

Let's assume that you got **ε = 200 mg/mL^{-1}cm^{-1}**. Then you take solution C2 and find that the Transmittance is **0.4052** in a 1.0 cm cell. Get **A** from **-log(T)** and use Beer-Lambert law:

$$\mathbf{A} = \varepsilon\, C\, b = \mathbf{0.3923} = 200\ \text{mg/mL}^{-1}\text{cm}^{-1} \times [1.0\ \text{cm}] \times C$$

$$0.3923 / \{200\ \text{mg/mL}^{-1}\text{cm}^{-1} \times [1.0\ \text{cm}]\} = \mathbf{C} = \mathbf{19.62 \times 10^{-4}}\ \text{mg Fe/mL}$$

and since the solution contains **1.5 X 10^{-4}** tablet/mL, the iron content per tablet is:

mg of Fe/tablet = [**19.62 X 10^{-4}** mg/mL] / [**1.5 X 10^{-4}** tablet/mL] = **13.08** mg Fe/tablet

Trial	Example	I	II	III	IV
[Tablet /mL] X 10^{-4}	1.5	_____	_____	_____	_____
Transmittance [%T/100]	0.4052	_____	_____	_____	_____
Absorbance [-log(T)]	0.3923	_____	_____	_____	_____
Fe conc [mg/mL] X 10^{-4}	19.62	_____	_____	_____	_____
mg Fe/tablet	13.08	_____	_____	_____	_____

Average mg Fe/tablet:_____

Compute the concentration of solutions B1, B2… in mg of Fe/mL. If these concentrations are not equal, how does that influence your results?