

Extinction coefficient determination

A sample with a molar mass of 915 amu was weighed out on an analytical balance. 5.2 milligrams were dissolved in 3.0 mL and then an 0.5 mL was added to a 1 mm pathlength cuvette. The absorbance measured was 0.95 at 532 nm. Based on this measurement what is the extinction coefficient at 532 nm?

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Step 1. Calculate the molarity of the sample.

$$c = \frac{5.2 \times 10^{-3}}{(915)(3 \times 10^{-3})} = 1.89 \times 10^{-3} M$$

Extinction coefficient determination

What is the extinction coefficient?

Step 2. Write out Beer's law and solve for the extinction coefficient.

$$A = \epsilon c \ell$$

And then plug in the known values:

$$\begin{aligned}\epsilon &= \frac{A}{c \ell} = \frac{0.95}{(1.89 \times 10^{-3} \text{ M})(0.1 \text{ cm})} \\ &= 5030 \text{ M}^{-1} \text{ cm}^{-1}\end{aligned}$$