

Exercise on the Lambert-Beer law

Exercise for week 6 (13.10.2025)

Let's consider a cuvette which can contain 3 cm^3 of liquid (optical path length: 1 cm). It is filled with a 2 mL solution containing an unknown concentration of absorbing molecules (molecular weight: 500 g/mol). The measured transmission at the wavelength λ_1 is 80% . After the addition of 0.7 mL of a solution containing $150 \mu\text{g}$ of the same absorber, the transmission of the final solution at the wavelength λ_2 is 55% . We know that $\epsilon_{\lambda_1} = 7.5 \times 10^5 \text{ cm}^2/\text{mol}$.

What was the initial concentration of absorbing molecules?

What is its molar extinction coefficient ϵ_{λ_2} ?

