

Task:

Suppose a solution of $\text{Co}(\text{NO}_3)_2$ has an extinction coefficient of $5.1 \text{ L/mol}\cdot\text{cm}$ at 505nm , show that a 0.0300M $\text{Co}(\text{NO}_3)_2$ solution will give an absorbance of 0.15 .

Solution:

The Beer-Lambert law (or Beer's law) is the linear relationship between absorbance and concentration of an absorbing species.

According to the Buger - Beer-Lambert law

$$A = \epsilon \cdot l \cdot c$$

A – absorbance

ϵ - extinction coefficient $\text{L}\cdot\text{mol}^{-1}\cdot\text{cm}^{-1}$

l – length of the cuvette, cm (usually it's 1 cm)

The absorbance of 0.0300M $\text{Co}(\text{NO}_3)_2$ solution is

$$A = 5.1 \cdot 1 \cdot 0.0300 = 0.15$$

Answer: $A = 0.15$