

# Absorbance

**Absorbance** is a quantity used in photometry and spectrophotometry. It indicates how much light was absorbed by the measured sample. In the literature, we can also encounter the older term *extinction*  $E$ .

We can define absorbance based on transmittance as:

$$A = -\log T,$$

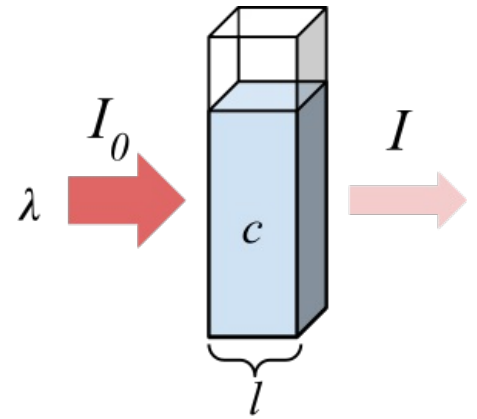
Where:

- $A$  is absorbance;
- $T$  is the transmittance of the same sample under the same conditions.

From the definition of transmittance, the relations for absorbance follow:

$$A = -\log T = -\log \frac{I}{I_0} = \log \frac{I_0}{I}$$

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



Light absorption

The last relationship is referred to as the **Lambert-Beer Law** (Johann Heinrich Lambert, 1728–1777). The practical advantage of its use is that the absorbance is directly proportional to the concentration of the absorbing substance.

From the equations above, it is clear that a sample that absorbs no light will have zero absorbance, an absorbance of 1 means that exactly one-tenth of the light has passed through the sample, with an absorbance of 2 exactly one-hundredth of the incoming light, etc. A negative absorbance would mean that more is passing through the sample light than a blank, usually due to a gross error or incorrect design of the experiment.

Absorbance is a dimensionless quantity.