

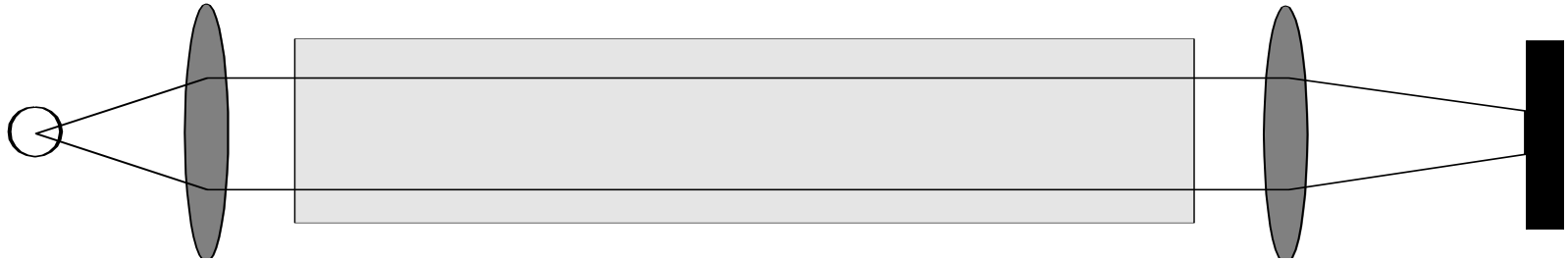
Inherent Optical Properties - Absorption

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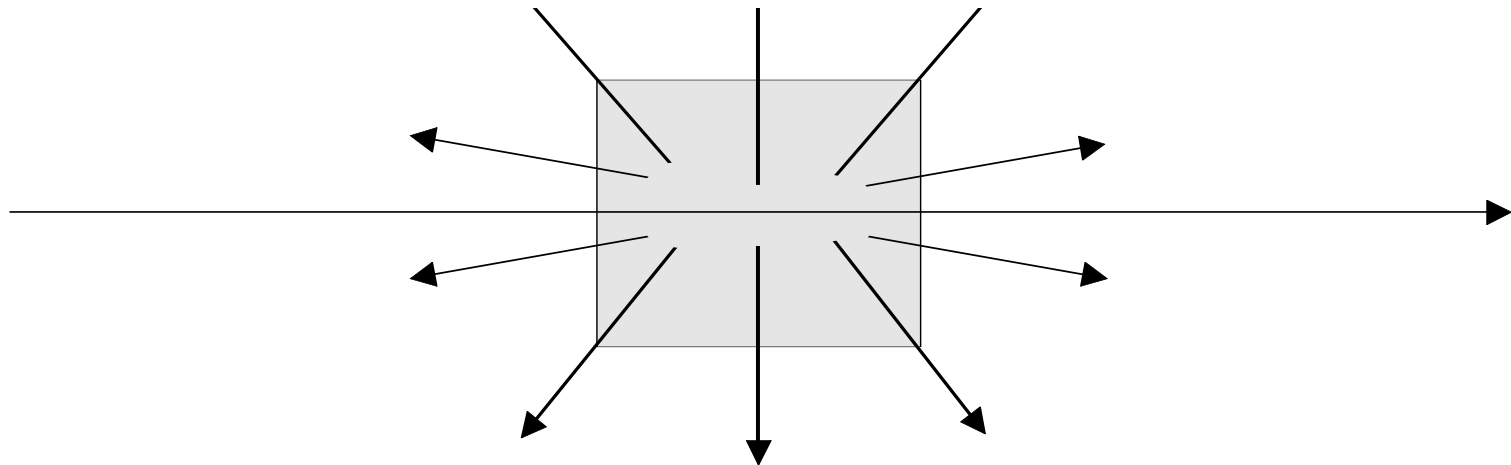
Absorption, Scattering and Beam Attenuation

- Attenuation of a beam by absorption and scattering
- Consider a beam of photons which collide with particles

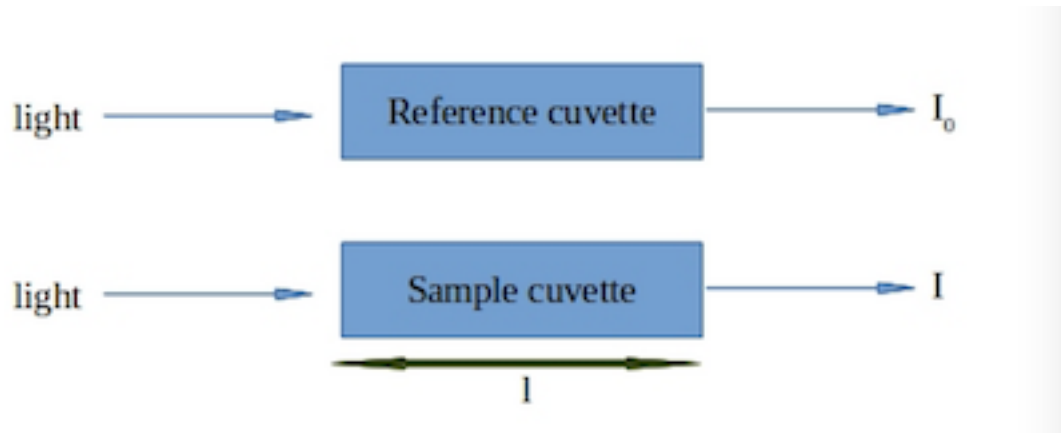


- The beam is attenuated: - by photons, which are absorbed;
- by photons, which are scattered into another direction and, thus, do not reach the detector.

$$c = a + b; [m^{-1}]$$



Beer-Lambert Law



- absorbance of a solution $A = \log_{10} I_0/I = a^*lc$
- Transmittance $T = I/I_0$
- a^* - specific absorption coefficient
- l – path length of light
- c – concentration of absorber in the solution

Liquid Waveguide Capillary Cell (LWCC)



- **Common spectrophotometers: 1cm or 10 cm cell**
- **Main purpose: Increase optical path length (50-500cm) by:**
- **Waveguide technology**
- **total internal reflection at the core/wall interface.**