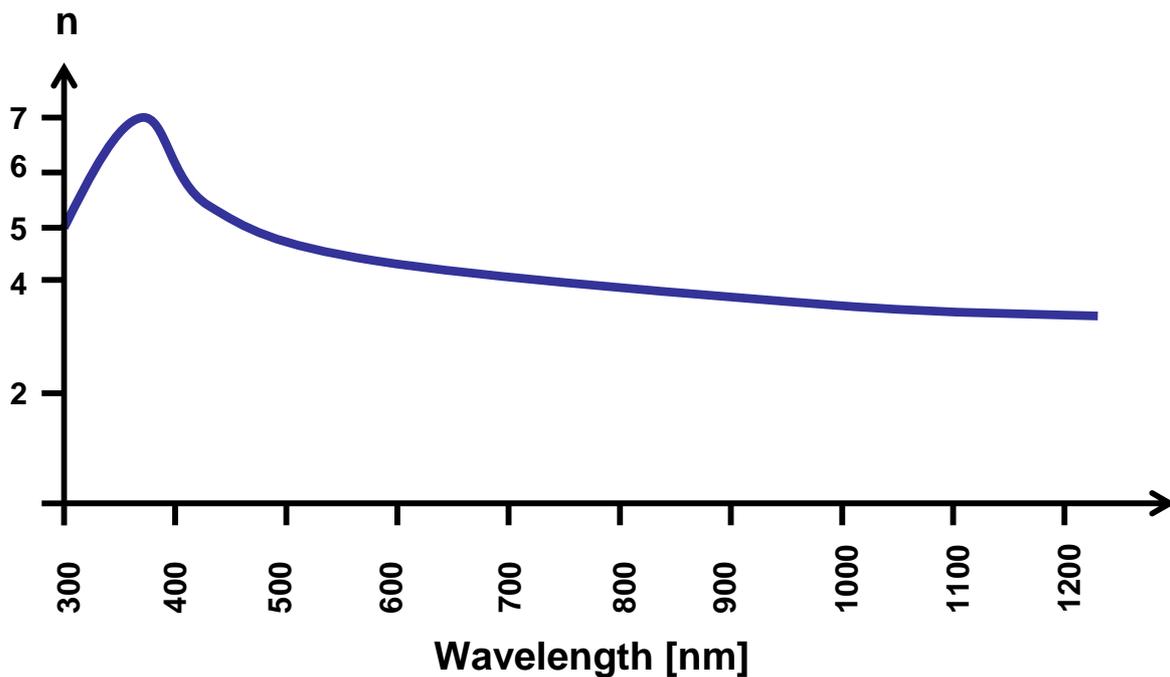


Exercises "Advanced materials B"

#8

Exercise 8: Basics on optics

Light with energy of 2 eV is applied on a material with the following diffraction index:



1. Which is the refraction index of this material at the given energy?
2. If the surrounding material is Air, and the angle of incidence of light is 30° with respect to the normal, in what angle is the light deflected inside the material?
3. When the light goes from the material to the air, at which angle of incidence a total internal reflection is obtained?
4. Using the Fresnel equations calculate the reflectance of the material at the used wavelength. Consider normal incidence.
5. Considering that the piece of material has a thickness of $300 \mu\text{m}$ and that the absorption coefficient for the used light is 3230 cm^{-1} , calculate the transmission through it.
6. The material has an absorption coefficient that suddenly decreases from 100 to 1 cm^{-1} for energies smaller than 1.1 eV . What can you deduce from this statement?