
Photochemistry I – Problems

Series C

- Nanoparticles ($r = 5$ nm) of a metal oxide are dispersed in water to form transparent colloids of various concentrations. Absorption spectra of colloidal dispersions containing 0.5 , 1.0 , 2.0 , and 5.0 $\text{g} \cdot \text{l}^{-1}$ of the oxide were measured in a 1 cm cuvette placed in front of an integrating sphere to subtract the extinction component due to light scattering.
 - Determine from the data given here below the absorption constant α [cm^{-1}] of the material at wavelengths $\lambda = 347$ nm and $\lambda = 320$ nm.
 - Knowing that the intrinsic absorption of light by the solid is due to an allowed transition, establish whether this is direct or indirect and determine the value of the bandgap energy E_g [eV] of the material.

