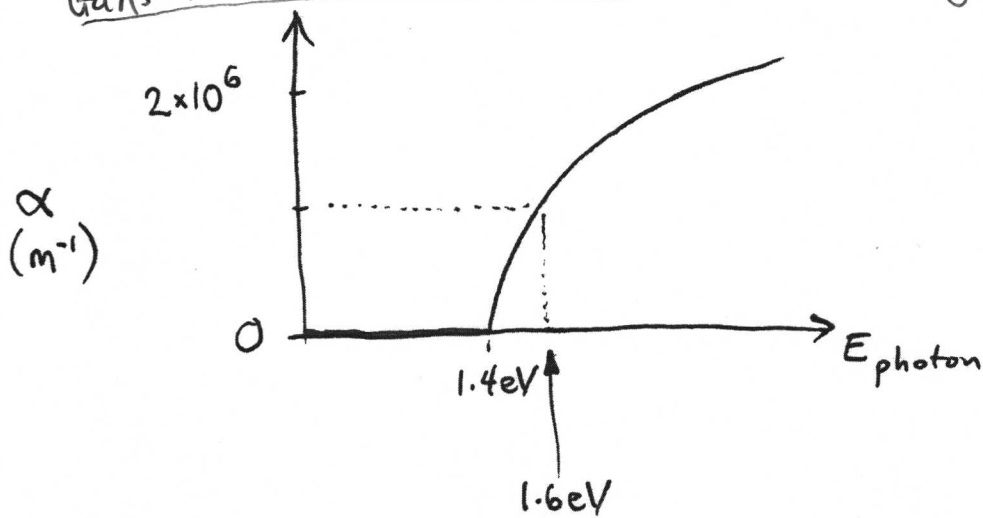


Quiz 19

GaAs Absorption Coefficient (direct band gap, $m_{\text{reduced}} \approx 0.06 m_e$)



- a) How thick should the GaAs absorber layer be in a solar cell? Design the solar cell to absorb $\approx 90\%$ of photons that have $E_{\text{photon}} = 1.6 \text{ eV}$.
- b) Consider another solar absorbing material with the same direct band gap ($E_g = 1.4 \text{ eV}$), but $m_{\text{reduced}} = m_e$. How thick does this new material need to be?