

Answer on Question #46457, Physics, Solid State Physics

Consider a superconductor with an energy gap of $1.7 \cdot 10^{-4}$ eV. Find the maximum wavelength of electromagnetic radiation which will be absorbed by this superconductor

Solution

Wavelength and energy are connected as

$$E = h\nu$$

where $h = 4.14 \cdot 10^{-15}$ eV·s is Planck constant. Hence, maximum wavelength of electromagnetic radiation which will be absorbed by this superconductor is

$$\nu = \frac{E}{h} = \frac{1.7 \cdot 10^{-4}}{4.14 \cdot 10^{-15}} \approx 0.41 \cdot 10^{11} \text{ Hz} = 41 \text{ GHz}$$