

Que. : We know that light (electromagnetic radiation) behaves like a wave and has polarization properties. So, if electron behaves like a wave, then what about its polarization properties?

Answer:

Light is one type of electromagnetic (EM) wave. EM waves are *transverse waves* consisting of varying electric and magnetic fields that oscillate perpendicular to the direction of propagation. There are specific directions for the oscillations of the electric and magnetic fields. *Polarization* is the attribute that a wave's oscillations have a definite direction relative to the direction of propagation of the wave. Waves having such a direction are said to be *polarized*. If electron behaves like a wave, then electron waves are longitudinal waves. While the longitudinal polarization describes compression of the solid and vibration along the direction of propagation. Photons have polarization due to intrinsic spin. Electrons also have intrinsic spin.