

Why electrons possess wave-like properties?

Answer: Such phenomena is called the wave-particle duality, it postulates that all particles and waves exhibit both wave and particle properties. A central concept of quantum mechanics, this duality addresses the inability of classical concepts like "particle" and "wave" to fully describe the behavior of quantum-scale objects. It means that electron can behave as a wave and as a particle depending to the observed phenomena; for example, electron diffraction is the demonstration of electron wave properties. According to the Louis de Broglie, every microparticle can act as a wave, with a corresponding wavelength

$\lambda$ , which is inversely proportional to the momentum of a particle.  $\lambda = \frac{h}{m \cdot v}$ , where  $h$  – Planck's constant;

$m$  – mass of the particle, kg;  $v$  – particle's velocity, m/s;