

Chapter 39

Particles Behaving as Waves

39.1 Constructing the Quantum Model of the Atom

8/24: • deBroglie: Integers come into play with waves, so why can't electrons (particles) have wavelengths?

– Rearranged $p = h/\lambda$ into

$$\lambda = \frac{h}{p}$$

where λ is the **deBroglie wavelength** and p is momentum.

• Thus, the Bohr model posits that the angular momentum of electrons is quantized (see Figure 7.7 from Labalme (2021)).

– Specifically, $n\lambda = 2\pi r_n$, i.e., some multiple of the wavelength equals the circumference of an orbit.

– To mathematically prevent collapsing atoms, posit a ground state described by $\lambda = 2\pi r_1$.