

## 4.1: Introduction

### Overview of key concepts and equations for the particle in a box

Potential energy	$V = 0$ inside box ( $0 < x < L$ ) $V = \infty$ outside box
Hamiltonian	$\hat{H} = -\frac{\hbar^2}{2m} \frac{d^2}{dx^2}$
Wavefunctions	$(\frac{2}{L})^{1/2} \sin(\frac{n\pi}{L}x)$
Quantum Numbers	$n = 1, 2, 3, \dots$
Energies	$E = n^2 (\frac{\hbar^2}{8mL^2})$
Spectroscopic Selection Rules	$\Delta n = \text{odd integer}$
Angular Momentum Properties	none

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