PHYSICS AND THE QUANTUM MECHANICAL MODEL

Section Review

Objectives

- Describe the relationship between the wavelength and frequency of light
- Explain how the frequencies of light are related to changes in electron energies
- Distinguish between quantum mechanics and classical mechanics
- Identify the cause of the atomic emission spectrum

Vocabulary

- amplitude
- wavelength (λ)
- frequency (ν)
- hertz (Hz)

- electromagnetic radiation
- spectrum
- atomic emission spectrum
- ground state

- photons
- Heisenberg uncertainty principle

Key Equations

- $c = \lambda \nu$
- $E = h \times v$
- $\bullet \ \ \lambda = \frac{h}{mv}$

Part A Completion

Use this completion exercise to check your understanding of the concepts and terms that are introduced in this section. Each blank can be completed with a term, short phrase, or number.

According to quantum mechanics, the motions of subatomic

particles may be described as ___1__. The frequency and wavelength of all waves are <u>2</u> related. Every element emits ____3 ___ if it is heated by passing an electric discharge through its gas or vapor. Passing this emission

through a prism gives the ___4__ of the element. The quantum concept developed from Planck's studies of

5 and Einstein's explanation of the 6 effect. Planck showed that the amount of radiant energy absorbed or emitted by a body is proportional to the ____7__ of the radiation.

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