

CHAPTER OVERVIEW

8: The Hydrogen Atom

The hydrogen atom is of special interest because the hydrogen atom wavefunctions obtained by solving the hydrogen atom Schrödinger equation are a set of functions called atomic orbitals that can be used to describe more complex atoms and even molecules. This feature is particularly useful because, as we shall see in Chapters 9 and 10, the Schrödinger equation for more complex chemical systems cannot be solved analytically. By using the atomic orbitals obtained from the solution of the hydrogen atom Schrödinger equation, we can describe the structure and reactivity of molecules and the nature of chemical bonds. The spacings and intensities of the spectroscopic transitions between the electronic states of the hydrogen atom also are predicted quantitatively by the quantum treatment of this system.

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