Figure 7.5 The electron orbits in the hydrogen atom according to Bohr and Sommerfeld's theory. The unit of length $a_0 = (\hbar/2\pi e)^2(1/m)$ is the first Bohr radius and is $0.54 \times 10^{-8}$ cm. $n$ is called the total quantum number and determines the main axis of the orbits and the energy. The quantum number $k \leq n$ gives the eccentricity of the orbit; $k - 1 = l$ gives the angular momentum in $\hbar/2\pi$ units.