

Rydberg constant

The Bohr model of the atom, while not a completely correct quantum mechanical model of the atom, does describe many of the accepted features of atomic theory. The Bohr model describes the atom as consisting of negatively charged electrons orbiting in circles, due to the Coulomb force, around a central positively charged nucleus. In Bohr's model, the electrons can only orbit at certain radii and the electron's energy remains constant at each radius. The electron can move from one energy level (one orbit) to another by absorbing or emitting radiation.

When a high voltage is placed across a thin tube filled with a monatomic gas, the tube is observed to glow. Electrons accelerated from the cathode to the anode collide with the gas atoms and excite the electrons in the atoms. When the excited electrons return to a lower energy state, they emit radiation. If the Bohr model of the atom is correct, what would you expect to see when the light from the tube is passed through a prism or grating? Explain your prediction in your lab notebook.

Read about atomic spectra in the handout.

Work the lab.