

Bohr magneton

According to the old Bohr model of the atom, electrons move in orbits around the nucleus. Atomic and molecular magnetic moments are expressed in Bohr magnetons.

- a. Find the magnetic moment of an electron in a hydrogen atom in a circular orbit of momentum p . HINT: what is the orbit's radius?
- b. According to the Bohr postulate, the angular momentum is quantized, $mvr = l \hbar$, where l is an integer and $\hbar = h/2\pi$ is Planck's constant. Calculate the value of the Bohr magneton μ_B , which is the magnetic moment of an electron orbit for which $l = 1$.
- c. Use the old Bohr model to find the average magnetic field at the center of a hydrogen atom with $l = 1$.