Estimating the Bohr Magneton Using the Einstein-De Haas Effect

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The Einstein-de Haas Effect is a fundamental effect first discovered in 1908. The experiment investigates the effect in which a ferromagnetic material is presented with an outside magnetic force. This disrupts the random magnetic dipole moments of the electrons inside the individual atoms. In an effort to align with the new magnetic field the electrons angular momentum is converted to angular momentum of the entire ferromagnet object. The degree of this rotation can then be measured. This principle is fundamental to many technologies such as SSDs that utilize spintronics. In this experiment the degree of rotation was measured at unique currents with five trials being spun both clockwise and counterclockwise. I then used this data to estimate the Bohr Magneton through several related equations. The Bohr Magneton is a measure of an electron magnetic moment. This magnetic moment is caused by the intrinsic spin of the electron. The Bohr Magneton is a known constant for all electrons. My estimate was off by a power of two. I am currently conducting hysteresis experiments to get the magnetization of the specific iron rod I am using to acquire a more accurate estimate.

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