The using stokes' formula for the viscous

The Discovery Of The ElectronThe electron was discovered in 1895 by J. J. Thomson in the form ofcathode rays, and was the first elementary particle to be identified. Theelectron is the lightest known particle which possesses an electric charge. Itsrest mass is Me 9.

1 x 10 -28 g, about 1/1836 of the massof the proton or neutron. The charge of the electron is -e = -4. 8 x 10^-10 esu

A. Milikan in 1909. In this experiment, the charges of dropletsof oil in air are measured by finding the electric field which balances eachdrop against its weight. The weight of each drop is determined by observing itsrate of free fall through the air, and using Stokes’ formula for the viscousdrag on a slowly moving sphere. The charges thus measured are integral multiplesof e.

Electrons are emitted in radioactivity and in many otherdecay processes. The electron itself is completely stable. Electrons contributethe bulk to ordinary matter; the volume of an atom is nearly all occupied by thecloud of elec trons surrounding the nucleus, which occupies only about 10^-13 ofthe atom’s volume.

The chemical properties of ordinary matter are determined bythe electron cloud. The electron obeys the Fermi-Dirac statistics, and for this reason isoften called a fermion. One of the primary attributes of matter, impenetrability, results from the fact that the elec tron, being a fermion, obeys the Pauliexclusion principle. The electron is the lightest of a family of elementary particles, theleptons. The other known charged leptons are the muon and the tau. These threeparticles differ only in mass; they have the same spin, charge, stronginteractions, and weak interactions.

In a weak interaction a charged lepton iseither unchanged or changed into and uncharged lepton, that is a neutri no. Inthe latter case, each charged lepton is seen to change only into thecorresponding neutrino. The electron has magnetic properties by virtue of (1) its orbital motionabout the nucleus of its parent atom and (2) its rotation about its own axis. The magnetic properties are best described through the magnetic dipole movementassociated with 1 and 2. The classical analog of the orbital magnetic dipolemoment of a small current-carrying circuit.

The electron spin magnetic dipolemoment may be thought of as arising from the circulation of charge, that is, acurrent, about the electron axis; but a classical analog to this moment has muchless meaning than that to the orbital magnetic dipole moment. The magneticmoments of the electrons in the atoms that make up a solid give rise to the bulkmagnetism of the solid. Science