

Conduction

Drift mobility: It is the drift velocity per unit applied electric field (V_d / E).

Drift velocity: It is the average electron velocity over all the conduction electrons in the conductor, in the direction of an applied electrical force.

Electrical conductivity: The ease with which charges flow inside the material along an applied electric field or a voltage gradient.

Fourier's law: It states that the heat flow per unit area per unit time is proportional to the temperature gradient. The constant of proportionality gives the thermal conductivity.

Hall effect: When a current carrying conductor is placed in a magnetic field perpendicular to the current, the charge carriers in the conductor experience a force perpendicular to both the current and the magnetic field. This phenomenon is called as Hall effect, which gives rise to an electric field called as Hall field. Hall coefficient gives the magnitude of the Hall effect. Hall effect is one of the experiments that demonstrates the **particle** behavior of electrons.

Joule's law: It states that the power dissipated per unit volume by a current-carrying conductor is proportional to the applied electric field and the current density.

Matthiessen's rule: The total resistivity of a metal is the sum of individual resistivities due to thermal vibrations, impurities, and crystallographic defects.

Nordheim's rule: The resistivity of an isomorphous alloy due to impurities is proportional to the concentrations of the solute and the solvent.

Residual resistivity: The resistivity arising due to scattering processes other than thermal vibrations of the lattice (e.g., grain boundaries, dislocations, point defects) .

Stefan's law: It states that energy radiated per unit time (or power) from a heated surface is proportional to the fourth power of the absolute temperature.

Thermal conductivity: The ease with which heat flows along the material from higher to lower temperatures. It is also defined as the rate of heat flow across a unit area per unit temperature.