

PPH207: CONDENSED MATTER PHYSICS LAB

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Course Learning Objective(s):

To experimentally realize the structural, optical, magnetic and electric behavior of condensed matters.

1. Determination of lattice constant and crystal structure of given powder sample using X-ray diffraction method.
2. Dynamics of mono and diatomic lattices.
3. Studies on the Electric Spin Resonance spectrum of the given DPPH sample and determination of Landeg factor.
4. Investigation of Hall Voltage as a function of current and magnetic field and determination of Hall Coefficient and carrier concentration of the given sample of semiconductor.
5. Study of magneto resistance behavior of semiconductor/manganites.
6. Investigation of Four probe and two probe resistance measurement and determination of contact resistance.
7. Investigation of B-H curve: (i) to determine the value of permeability and coercivity of ferrite sample. (ii) to distinguish between soft and hard ferrites.
8. Investigation of ferroelectric behavior of BaTiO₃.
9. To determine the Curie temperature of given ferrite sample.
10. To determine the dielectric constant of PCB laminate.
11. To determine the Young's modulus of brass using ultrasonic interferometer.
12. Studies on the thermoluminescence of KCl/KBr single crystal sample and determination of activation energy and color centers.

Course Learning Outcomes (CLO):

Students will have understanding of:

1. How to determine the crystal structure, lattice parameter and crystallite size?
2. Measurement and analysis of various types of transport.
3. Optical characterization of solid.
4. Magnetic and dielectric behavior of solids.