

PPH212 PHYSICS LAB IV

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Course Learning Objective(s): To experimentally realize the structural, optical, magnetic and electric behavior of condensed matters.

List of Experiments:

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. 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.
4. Study of magneto resistance behavior of semiconductors/manganites.
5. Investigation of Four probe and two probe resistance measurement and determination of contact resistance.
6. 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.
7. Investigation of ferroelectric behavior of BaTiO₃.
8. To determine the Curie temperature of given ferrite sample.
9. To determine the dielectric constant of PCB laminate.
10. To determine the Young's modulus of brass using ultrasonic interferometer.
11. Studies on the thermoluminescence of KCl/KBr single crystal sample and determination of activation energy and color centers.
12. Determination of T_c for the given superconductivity material.

Course learning outcomes: Students will have achieved the ability to:

1. determine the lattice parameters and crystallite size for a given compound
2. measure Hall coefficient, resistance and magnetoresistance of a given semiconductor.
3. calculate the Curie temperature and energy loss of a ferrite sample.
4. investigate the B-H curve of ferrites and distinguish between hard and soft ferrites on the basis of coercivity.
5. measure the dielectric constant of a dielectric material.
6. determine the Young's modulus of a given metal/metal alloy using ultrasonic interferometer.

Evaluation Scheme:

Sr. No.	Evaluation Elements	Weightage (%)
1	Lab Evaluation	100