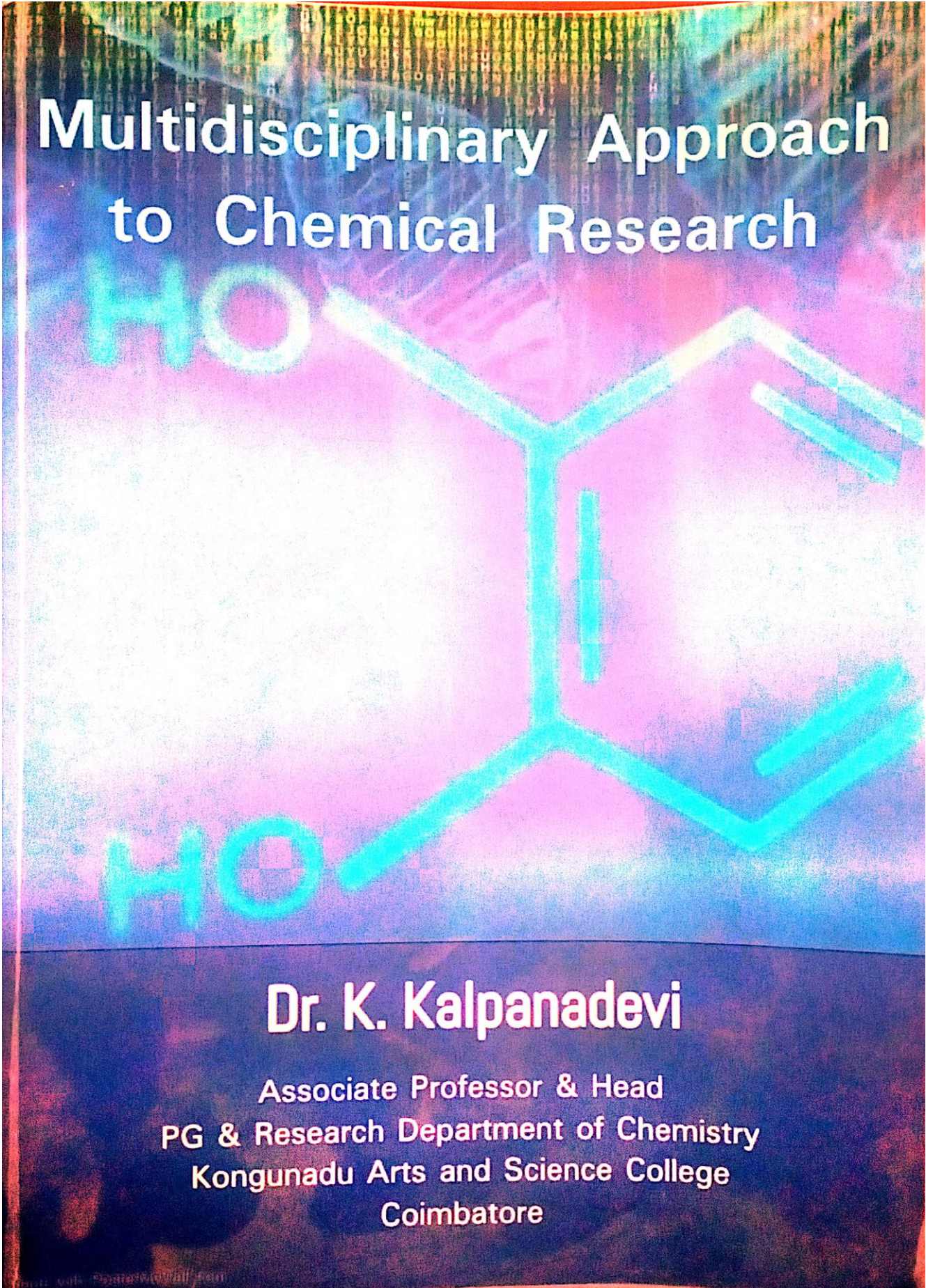
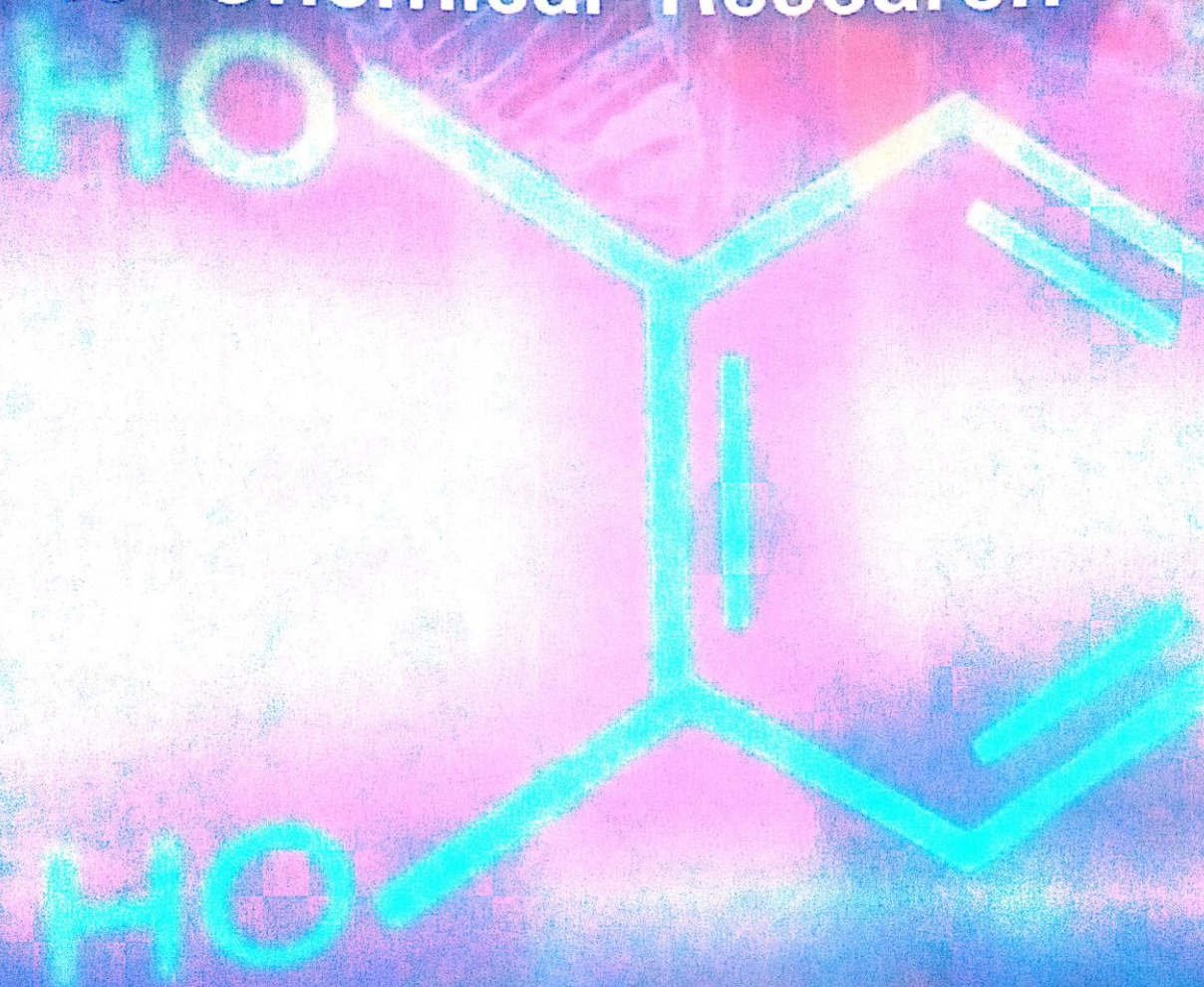




Multidisciplinary Approach to Chemical Research



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MAGNETIC PROPERTIES AND CHARACTERIZATION OF DOPED AND UNDOPED METALLIC OXIDE NPs

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ABSTRACT

The paper reviews with the content about different magnetometers, in specific about vibrational sample magnetometer and its advantages. Magnetometers are used to calibrate electromagnets and permanent magnets and to determine the magnetization of the material. Magnetic materials are ubiquitous nowadays due to their massive use in energy management, data storage, technological devices, transportation, biomedicine, or environmental protection[1–3]. Among different types of magnetometers VSM plays a vital role in characterizing various metallic magnetic properties. The paper includes the magnetic characterization of Iron oxide(Fe_3O_4) NPs, Nickel oxide (NiO) NPs, Cobalt oxide Co_3O_4 NPs, Cobalt ferrite (CoFe_2O_4) Nps, Manganese-doped superparamagnetic iron oxide NPs, Palladium, platinum and ruthenium magnetic nanopowders ($\text{Pd}-\text{Fe}_3\text{O}_4$, $\text{Pt}-\text{Fe}_3\text{O}_4$, $\text{Ru}-\text{Fe}_3\text{O}_4$).

Keywords: SPIONPs-Superparamagnetic Iron Oxide Nanoparticles, NPs-NanoParticles, VSM-Vibrating Sample Magnetometer, GMR and CMR-Giant Magnetoresistive Materials/ Colossal Magnetoresistive Materials.

1. INTRODUCTION

Magnetometers determine the direction, strength, or relative variation in the magnetic field at a certain location. We also use magnetometers to calibrate electromagnets and permanent magnets and to determine the magnetization of the material. Vibrating Sample Magnetometer (VSM) systems are used to measure the magnetic properties of materials as a function of magnetic field, temperature, and time. They are ideally suited for research and development, production testing, quality and process control. Powders, solids, liquids, single crystals, and thin films are all readily accommodated in a VSM.

Applications of magnetometers:

- In doing geographical and archaeological surveys.