

CHAPTER 52  
TECHNOLOGY  
APPLIED SCIENCES AND HUMANITIES

Doctoral Theses

01. MEENU  
**Investigations on Spinal Ferrite CNT Composites and their Device Applications.**  
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*Abstract*

The goal of this thesis study is to conduct a systematic analysis of CNTs doped Ferrites with the qualities to be researched being structural, magnetic, dielectric properties, and electromagnetic analysis. The co-precipitation method is used to create the following compositions (a) NZF-MWCNTs (b) CFO-PANI-PVDF (c) CZFO-MWCNTs. Furthermore, all properties have been validated using appropriate analysis techniques such as X-ray diffraction, Rietveld analysis, Raman spectroscopy, Fourier transform Infrared spectroscopy analysis, UV- visible Spectroscopy, Scanning Electron Microscopy analysis, Transmission Electron Microscopy, Vibrating Sample Magnetometer, LCR metre, Vector Network Analyzer, and so on. The thesis is broken into six chapters. The first chapter introduces ferrites, carbon nanotubes, and polymers, as well as relevant introductory background. The experimental specifics are covered in Chapter 2. The characteristics of NZF-CNTs composites are discussed in Chapter 3. Chapter 4 deals with the analysis of CFO-PANI-PVDF. The fifth chapter examines MWCNT doped CZFO nano-composites. Chapter 6 reviews the entire research and addresses the work's future scope.

*Contents*

1. Introduction and Research objectives. 2. Experimental details: materials synthesis and characterization. 3. Synthesis and characterization of NZF-MWCNTs nanocomposites for EMI shielding. 4. EMI shielding properties of  $\text{CoFe}_2\text{O}_4$ /Polyaniline/poly (vinylidene fluoride) nanocomposites 5. Synthesis of conductive network structure of MWCNTs-cobalt-zinc ferrite nanocomposite for enhanced electromagnetic shielding applications. 6. Summary and future scope of work. List of research publications. Copies of reprints of published research papers included in Thesis.