Synthesis and structural characterization of amorphous and nanocrystalline materials of chalcogenides substituted with transition elements

Thesis

Submitted for the degree of M.Sc. in Science as a partial fulfillment for requirements of the Master of Science

By

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B.Sc., Physics and computer, Ain Shams University, 1996

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To my husband, my love and my best friend

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Having you is the greatest fortune in my life

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Thesis outline

This thesis is organized in five chapters:

Chapter 1: This chapter presents the theoretical background and literature review on the structures, microstructures, magnetic properties, electrical properties and applications of Se, MnSe and FeSe that of relevance to this thesis.

Chapter 2: This chapter presents an introduction to X-ray powder diffraction , line profile (peak shape) parameters, peak shape functions, whole-powder-pattern decomposition method, Rietveld method, R-values, sources of peak (line) broadening, sources of instrumental broadening, sample imperfections and microstructure, broadening due to size and strain and finally size and strain analysis.

Chapter 3: This chapter presents an introduction to magnetic materials, magnetic dipoles, magnetic moments, domain structure and hysteresis loop. It also presents an introduction to the dielectric materials, alternating current a.c. conductivity, dielectric constant, dielectric loss and finally dielectric strength

Chapter 4: This chapter deals with all types of experimental methods; synthesis and characterization of the materials investigated in this thesis.

Chapter 5: This chapter deals with all results attained from different properties and discussions of the outcome results and finally it ends with conclusions with highlighting the most important findings.

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