Glass Nanocomposites. Micro and Nano Technologies

Description: Glass Nanocomposites: Synthesis, Properties and Applications provides the latest information on a rapidly growing field of specialized materials, bringing light to new research findings that include a growing number of technologies and applications. With this growth, a new need for deep understanding of the synthesis methods, composite structure, processing and application of glass nanocomposites has emerged.

In the book, world renowned experts in the field, Professors Karmakar, Rademann, and Stepanov, fill the knowledge gap, building a bridge between the areas of nanoscience, photonics, and glass technology. The book covers the fundamentals, synthesis, processing, material properties, structure property correlation, interpretation thereof, characterization, and a wide range of applications of glass nanocomposites in many different devices and branches of technology.

Recent developments and future directions of all types of glass nanocomposites, such as metal-glasses (e.g., metal nanowire composites, nanoglass-mesoporous silica composites), semiconductor-glass and ceramic-glass nanocomposites, as well as oxide and non-oxide glasses, are also covered in great depth. Each chapter is logically structured in order to increase coherence, with each including question sets as exercises for a deeper understanding of the text.

- Provides comprehensive and up-to-date knowledge and literature review for both the oxide and non-oxide glass nanocomposites (i.e., practically all types of glass nanocomposites)
- Reviews a wide range of synthesis types, properties, characterization, and applications of diverse types of glass nanocomposites
- Presents future directions of glass nanocomposites for researchers and engineers, as well as question sets for use in university courses

Contents:

1. Fundamentals of Glass and Glass Nanocomposites
2. Glass-based Nanocomposites
3. Crystallization Mechanisms of Nanostructures in Silicate Glass: From Complete Characterization towards Applications
4. Laser Annealing of Metal Nanoparticles Synthesized in Glasses by Ion Implantation
5. Photoluminescence and Nonlinear Optical Properties of Rare Earth Doped Heavy Metal Oxide Glasses with Metallic Nanoparticles
6. In situ Metal Nanoparticle Generated Oxide Films on Glass by the Sol-Gel Process
7. Nonlinear Optical Properties of Metal Nanoparticles in Silicate Glass
8. Electrical Transport Properties of Ion-Conducting Glass Nanocomposites
9. Nanometals in Antimony and Bismuth Oxide Glasses
10. Metal Glass Nanocomposites: Preparation, Properties and Applications
11. Functionality of Radiation Induced Reversible Silver Nanoparticles in Glasses and Their Applications
12. Semiconductor Glass Nanocomposites: Preparation, Properties and Applications
14. Effects of Gamma-irradiation and Ion Implantation in Chalcogenide Glasses
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