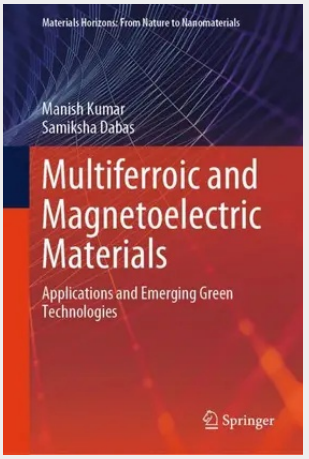
Kumar / Dabas

Multiferroic and Magnetoelectric Materials

Applications and Emerging Green Technologies



This book comprehensively introduces the multiferroic and magnetoelectric materials, details the structural aspect and majorly focuses on the applicability part of the newly emerging non-toxic magnetoelectric and multiferroic materials, green synthesis techniques and energy harvesting applications. It covers in detail applications pertaining to energy harvesting, spintronic, photovoltaic and photo-catalysis, sensors, gyrators, gradiometer, transducers and memory storage devices. Eco-friendly lead free multiferroic-based smart materials are being increasingly used as sensors and actuators in nano- or micro-electromechanical systems (N/MEMS) devices. Magnetoelectric coupling-based N/MEMS devices are found to exhibit high-quality factor and can be integrated with radio frequency integrated circuits. The non-toxic magnetoelectric antenna has biomedical applications as well, especially in neurology. Further, the book classifies and describes the magnetoelectric and multiferroic materials-based applications into three types on the basis of direct magnetoelectric coupling, converse magnetoelectric coupling and combination of both direct and converse magnetoelectric coupling. Overall, the book concludes by summarizing the much-needed detailed analysis of green, non-toxic and viable commercial technology on magnetoelectric and multiferroic materials. Emerging concepts of quantum electromagnets, quantum criticality and cosmic string lab stimulation have also been briefly summarized.

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