



Piezoelectric Materials and Devices: Applications in Engineering and Medical Sciences

M. S. Vijaya

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Piezoelectric Materials and Devices: Applications in Engineering and Medical Sciences provides a complete overview of piezoelectric materials, covering all aspects of the materials starting from fundamental concepts. The treatment includes physics of piezoelectric materials, their characteristics and applications. The author uses simple language to explain the theory of piezoelectricity and introduce readers to the properties and design of different types of piezoelectric materials, such as those used in engineering and medical device applications.

This book:

- Introduces various types of dielectrics and their classification based on their characteristics
- Addresses the mathematical formulation of piezoelectric effects and the definition of various piezoelectric constants
- Describes the structure and properties of practical piezoelectric materials such as quartz, lead zirconate titanate, barium titanate, zinc oxide, and polyvinylidene fluoride
- Covers the entire gamut of piezoelectric devices used in engineering and medical applications
- Discusses briefly the use of piezoelectric materials for energy harvesting and structural health monitoring
- Explores new developments in biomedical applications of piezoelectric devices such as drug delivery, blood flow and blood pressure monitoring, robotic operating tools, etc.
- Elaborates on design and virtual prototyping of piezoelectric devices through the use of FE software tools ANSYS and PAFEC

Giving design engineers, scientists, and technologists the information and guidance they will need to adopt piezoelectric materials in the development of smart devices, this book will also motivate engineering and science students to initiate new research for developing innovative devices. Its contents will be invaluable to both students and professionals seeking a greater understanding of fundamentals and applications in the evolving field of piezoelectrics.

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