the additive, there is limited information on typical performance of the additive or typical percentages used in a formulation. The extensive address list enables further research once an additive family has been identified.

Formulators involved with the preparation of polymers using additives will find this book to be a useful central reference for identifying and sourcing a wide variety of commonly used additives/fillers for polymers.

MEMS and NEMS – Systems, Devices, and Structures

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There is an accelerating interest in microelectrical mechanical (MEM) devices and nanotechnology. The future in MEMS holds revolutionary breakthroughs in a wide range of technologies: nanocircuits, actuators, sensors, nanocomputers, radar, locators, materials, imaging, data storage, medicine, and human genome synthesis, etc. No one knows for sure what will be developed in the future when, but this type of technology will be at the forefront. MEMS and NEMS (nanoelectromechanical machines) are multidisciplinary fields where one must be adept in areas of engineering, also chemistry, material science, physics, and any specialized field for applications in bioengineering or medicine.

This book, mainly written for a one-semester senior level or graduate level course on MEMS and NEMS, provides an excellent introduction to MEMS and NEMS systems, devices, structures, and fabrication. It does bring together some concepts, techniques, and methods for modeling, designing, and analyzing MEMS and NEMS, but its main strength is in the mathematical models derived for the various devices covered in the text. The book consists of eight chapters. The first two chapters cover an introduction to MEMS and NEMS with a brief analog to biological systems and various applications where MEMS might be useful. These are general examples just to show potential areas of use. The third chapter gives a good description of the fundamentals of the fabrication of MEMS along with descriptions of equipment used to produce MEMS. This is a good overview of practical technology currently in use. The main focus of this book, chapters four and five, covers the conception, modeling, analysis, and simulation of MEMS and NEMS. Some examples of the devices are two- and three-phase induction micromotors, permanent magnet stepper micromotors, piezotransducers, and radiating energy micro devices. Detailed mathematical models of the devices are derived for each of these devices using Kirchhoff and Newton's laws along with a lot of linear algebra and differential equations. It appears that these models could apply to any scale size device. It is not clearly pointed out as to how various parameters are affected as the scale size changes from centimeters to microns to nanometers. Chapter six contains quantum mechanics and more mathematical models of molecular wires and molecular circuits. Chapter seven is on control theory (Lyapunov stability, tracking, and other control theory equations). The final chapter contains case studies on micromotors, micro fabrication of coils, magnetic depositions, micro machined polymer magnets, and various other motors.

The book is an excellent place to begin studying MEMS and NEMS.

Annual Review of Physical Chemistry, Vol. 53

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Many of the concerns of readers of *Electrical Insulation* have a component of physical chemistry, including surface and interfacial phenomena, polymer morphology, dielectric properties, chemical reaction kinetics, and thermodynamics. Chapters in this year's volume discuss these topics, although not explicitly as it pertains to electrical properties or electrical equipment. Among the chapters that may be of interest to our readers are optical spectroscopy of liquids, reversible polymerizations and aggregations, electronic properties of single-walled carbon nanotubes, electron transfer at molecule-metal interfaces, and molecular theory of hydrophobic effects.

—K. F. Schoch, Jr.

Annual Reviews of Materials Research, Vol. 32

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The 2002 edition of *Annual Reviews of Materials Research* is devoted exclusively to computational materials research. Application of computational methods to a wide rage of fields is discussed. For the most part, these methods are applied to modeling and predicting physical phenomena at the micro structural level. Among the physical processes covered in chapters in this volume are recrystallization, solidification, fracture, phase segregation, chemical vapor deposition, and crack propagation. Other chapters focus on modeling properties of particular classes of materials, such as nanotubes, polymers, and magneto electrics. Readers of *Electrical Insulation* that would find this volume most useful would be those involved in modeling physical behavior of materials used in electrical equipment.

—K. F. Schoch, Jr.