

It contains very good practical information on the properties and performance of PVC formulations, with just enough chemistry and physics to explain the fundamental theories being presented. If you work with PVC, this book will be an invaluable reference source.

## Advanced Batteries

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Energy is often present in one form but required for use in another form, and thus conversion is required. Furthermore, energy may be available in amounts and at times and places incompatible with the intended use. Thus, devices and methods to store and transport energy are necessary. It can be stored mechanically in flywheels or in the form of heat. However, compared to other forms of energy, chemical energy is more efficiently and conveniently stored. Batteries provide a means of storing chemical energy for later conversion to electrical energy. With some types of batteries, the process can be reversed, i.e., electrical energy is used to produce and store chemical energy. The greater the efficiency and the lower the cost of rechargeable batteries, the more numerous their practical applications. Thus, electric cars rely entirely on battery energy for propulsion. Unfortunately, the technology is not quite mature, and today hybrid vehicles combine a battery with an internal combustion engine. Many factors need to be considered when it comes to developing an all-electric car, but obviously materials play a critical role in advancing battery technology to meet these and other needs of the future.

This timely book focuses on the materials science principles of advanced battery technology. It provides the reader with an understanding of how the latest advanced materials used in batteries function, with the intention of giving researchers a foundation for further developing the technology. It emphasizes the

underlying principles applicable to the electrochemical materials (electrodes and electrolyte) in advanced batteries. Significant progress in recent years has shown that the role played by the electrode materials and their kinetic behavior often determines the potential and capacity of the battery. This book does not cover every major type of battery system. It omits the common lead acid cell and electrical double-layer cells, and concentrates on more advanced systems incorporating a wide range of electrode materials, e.g., lithium, zinc, cadmium, metal hydride and nickel, and an equally wide range of liquid and solid electrolytes.

The early chapters provide a very good tutorial on important practical matters, e.g., how potentials and capacities of batteries are determined, self-discharge mechanisms, cycling behavior, equivalent circuits, and fundamental electrode processes. Extensive reference lists, a summary, and many illustrations and graphs are provided for each chapter, with the author bringing great technical insight to bear on the subject. Explanations such as why a memory effect can occur in batteries containing nickel electrodes, i.e., why nickel metal hydride cells will not regain a full charge unless first deeply discharged, are very interesting. This mechanism was only recently discovered.

This book is an outstanding technical resource on advanced battery technology for students or researchers who want to learn about the principles underlying today's battery technology and the behavior of the associated materials. It will definitely help to advance battery technology by providing new researchers with the tools and ideas necessary to develop the next generation of batteries.

## The Lineman's and Cableman's Field Manual, 2nd Edition

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This handbook is intended to provide information on the construction, operation, and maintenance of overhead and underground electric distribution and transmission lines. It is in a format suitable for quick and easy reference on-site. It is intended to be the field guide for the more comprehensive book titled *The Lineman's and Cableman's Field Manual*. It is written for the apprentice, the lineman, the cableman, the foreman, the supervisor, and other employees of electric line construction contractors, and for transmission and distribution departments within electric utility companies. It is a book to take along to job sites. It even has sections at the end of each chapter for notes on the lessons learned on each installation. The book is not intended to teach about the theory of transmission and distribution (T&D) systems, but rather to provide a working knowledge of what is required to install T&D systems safely and properly.

This is a practical book for those working on these systems. It contains definitions of electrical terms and diagrams of electric power systems, line conductors, cables, splices, terminations, distribution transformers, wire guying, lightning and surge arrestors, fuses, inspection and maintenance plans, tree trimming, rope knots, grounding, safety equipment, and rescue measures. It also provides many tables of conductor properties, photos of cables and wire, time-current curves, and drawings of electrical components and equipment used to install cables.

Although many of our readers may not be directly involved with the installation of T&D systems, some may be interested in this handbook from an educational standpoint—learning about how these systems are installed.

## Lead Your Boss

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