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Disadvantages; 2.5 Button Batteries
2.5.1 Mercury Oxide Battery2.5.2 Zn/Ag2O Battery; 2.5.3 Metal-Air Batteries; 2.5.3.1 Zn/Air Battery; 2.5.3.2 Aluminum/Air Batteries; 2.6 Li Primary Batteries; 2.6.1 Lithium/Thionyl Chloride Batteries; 2.6.2 Lithium/Sulfur Dioxide Cells; 2.7 Oxyride Batteries; 2.8 Damage in Primary Batteries; 2.9 Conclusions; References; 3: A Review of Materials and Chemistry for Secondary Batteries; 3.1 The Lead-Acid Battery; 3.1.1 Electrochemical Reactions; 3.1.2 Components; 3.1.3 New Components; 3.2 The Nickel-Cadmium Battery; 3.2.1 Electrochemical Reactions; 3.3 Nickel-Metal Hydride (Ni-MH) Batteries
3.4 Secondary Alkaline Batteries3.4.1 Components; 3.5 Secondary Lithium Batteries; 3.5.1 Lithium-Ion Batteries; 3.5.2 Li-Polymer Batteries; 3.5.3 Evaluation of Li Battery Materials and Chemistry; 3.6 Lithium-Sulfur Batteries; 3.7 Conclusions; References; 4: Current and Potential Applications of Secondary Li Batteries; 4.1 Portable Electronic Devices; 4.2 Hybrid and Electric Vehicles; 4.3 Medical Applications; 4.3.1 Heart Pacemakers; 4.3.2 Neurological Pacemakers; 4.4 Application of Secondary Li Ion Battery Systems in Vehicle Technology; 4.4.1 Parallel Connection; 4.4.2 Series Connections
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6.6 Nanofiber/Nanotube/Nanowire Anodes

Sommario/riassunto

Materials Engineering for High Density Energy Storage provides first-hand knowledge about the design of safe and powerful batteries and the methods and approaches for enhancing the performance of next-generation batteries. The book explores how the innovative approaches currently employed, including thin films, nanoparticles and nanocomposites, are paving new ways to performance improvement. The topic's tremendous application potential will appeal to a broad audience, including materials scientists, physicists, electrochemists, libraries, and graduate students.