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Nota di contenuto	Cover; Related title; Title; Copyright page; Preface; List of Contributors; 1: General Concepts; 1.1 Brief Outline of Batteries; 1.2 Early Development of Lithium-Ion Batteries; 1.3 Toward a Realistic Goal; References; 2: Lithium Insertion Materials Having Spinel-Framework Structure for Advanced Batteries; 2.1 Introduction; 2.2 Structural Description of Spinel; 2.3 Derivatives of Spinel-Framework Structure; 2.4 Electrochemistry of Lithium Insertion Materials Having Spinel-Framework Structure 4.4 3D Olivine-Type Phosphate Cathode 4.5 3D Calcite-Type Borate Cathode; 4.6 3D Perovskite-Type Fluoride Cathode; 4.7 Summary; References; 5: Thermodynamics of Electrode Materials for Lithium-Ion Batteries; 5.1 Introduction; 5.2 Experimental; 5.3 Results; 5.4 Conclusion; References; 6: Raman Investigation of Cathode Materials for Lithium Batteries; 6.1 Introduction; 6.2 Raman Microspectrometry: Principle and Instrumentation; 6.3 Transition Metal-Oxide-Based Compounds; 6.4 Phospho-Olivine LiMPO ₄ Compounds; 6.5 General Conclusion; References 7: Development of Lithium-Ion Batteries: From the Viewpoint of

Importance of the Electrolytes 7.1 Introduction; 7.2 General Design to Find Additives for Improving the Performance of LIB; 7.3 A Series of Developing Processes to Find Novel Additives; 7.4 Cathodic and the Other Additives for LIBs; 7.5 Conditioning; References; 8: Inorganic Additives and Electrode Interface; 8.1 Introduction; 8.2 Transition Metal Ions and Cathode Dissolution; 8.3 How to Suppress the Mn(II) Degradation; 8.4 Alkali Metal Ions; 8.5 Alkali Salt Coating; 8.6 Summary; References
11: Research and Development Work on Advanced Lithium-Ion Batteries for High-Performance Environmental Vehicles

Sommario/riassunto

Starting out with an introduction to the fundamentals of lithium ion batteries, this book begins by describing in detail the new materials for all four major uses as cathodes, anodes, separators, and electrolytes. It then goes on to address such critical issues as self-discharge and passivation effects, highlighting lithium ion diffusion and its profound effect on a battery's power density, life cycle and safety issues. The monograph concludes with a detailed chapter on lithium ion battery use in hybrid electric vehicles. Invaluable reading for materials scientists, electrochemists, physici
