1.

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Development Process; 2 LiPF6 SALT STABILIZERS; 2.1 Hindering and Deactivating PF5; 2.2 Impurity Scavenging; 2.3 Anion Receptors; 3 OVERCHARGE PROTECTORS; 3.1 Redox Shuttles; 3.2 Shutdown Additives; 4 FLAME RETARDANTS; 4.1 Classical Phosphates; 4.2 Cyclic Phosphazenes; 4.3 Ionic Liquids as Additives
5 SYNERGY EFFECTS BETWEEN ELECTROLYTE ADDITIVES 5.1 Double-Functionality Additives; 5.2 Synergies of Single-Functionality Additives; 6 CONCLUSIONS; REFERENCES; CHAPTER 4 ELECTROLYTES FOR LITHIUM-ION BATTERIES WITH HIGH-VOLTAGE CATHODES; 1 INTRODUCTION; 2 OXIDATION REACTIONS OF THE ELECTROLYTE WITH TRADITIONAL METAL OXIDE CATHODE MATERIALS; 3 THERMAL REACTIONS OF THE ELECTROLYTE WITH THE SURFACE OF METAL OXIDE CATHODES; 4 FORMULATION OF ELECTROLYTES FOR HIGH-VOLTAGE MATERIALS; 4.1 Chemistry of Cathodes at High Voltage
4.2 Novel Organic Solvents with Greater Oxidative Stability: Sulfones, Nitriles, and Fluorinated Solvents 4.3 Novel Additives for Cathode Surface Passivation; 5 SUMMARY; REFERENCES; CHAPTER 5 CORE-SHELL STRUCTURE CATHODE MATERIALS FOR RECHARGEABLE LITHIUM BATTERIES; 1 INTRODUCTION; 2 LAYER-STRUCTURED CORE-SHELL; 3 LAYER-STRUCTURED CORE-SHELL PARTICLES WITH A CONCENTRATION GRADIENT; 4 SPHERICAL CORE-SHELL Li[(Li0.05Mn0.95)0.8(Ni0.25Mn0.75)0.2]2O4 SPINEL; 5 CONCLUSIONS; Acknowledgments; REFERENCES; CHAPTER 6 PROBLEMS AND EXPECTANCY IN LITHIUM BATTERY TECHNOLOGIES; 1 INTRODUCTION
2 IMPORTANCE OF ENERGY STORAGE 3 DEVELOPMENT OF LITHIUM BATTERIES; 3.1 Lithium Batteries for Electric Vehicles; 3.2 Lithium Batteries for Mobile Applications; 4 DEVELOPMENT OF MATERIALS FOR RECHARGEABLE LITHIUM BATTERIES; 4.1 Safety; 4.2 Lifetime; 4.3 High Energy Density; 4.4 Cathode Materials; 4.5 Anode Materials; 4.6 Electrolytes; 5 PRODUCTION OF ELECTRODES FOR LITHIUM BATTERIES; 5.1 Energy and Power Density; 5.2 Particle Nature; 5.3 Composite Electrodes; 5.4 Current Collectors; 6 SUMMARY; REFERENCES; CHAPTER 7 FLUORINE-BASED POLYANIONIC COMPOUNDS FOR HIGH-VOLTAGE ELECTRODE MATERIALS
1 INTRODUCTION

Sommario/riassunto

Explains the current state of the science and points the way to technological advances First developed in the late 1980's, lithium-ion batteries now power everything from tablet computers to power tools to electric cars. Despite tremendous progress in the last two decades in the engineering and manufacturing of lithium-ion batteries, they are currently unable to meet the energy and power demands of many new and emerging devices. This book sets the stage for the development of a new generation of higher-energy density, rechargeable lithium-ion batteries by advancing battery chemical