1. Record Nr. UNINA9910830150503321

| | |
|---|---|
| Titolo | Lithium ion batteries : fundamentals and performance / / M. Wakihara, O. Yamamoto, eds |
| Pubbl/distr/stampa | Weinheim, [Germany] : , : Wiley-VCH, , 1998<br>©1998 |
| ISBN | 1-282-01025-5<br>9786612010255<br>3-527-61200-9<br>3-527-61198-3 |
| Descrizione fisica | 1 online resource (264 p.) |
| Disciplina | 621.31242<br>621.312423 |
| Soggetti | Lithium cells |
| Lingua di pubblicazione | Inglese |
| Formato | Materiale a stampa |
| Livello bibliografico | Monografia |
| Note generali | Description based upon print version of record. |
| Nota di bibliografia | Includes bibliographical references and index. |
| Nota di contenuto | Lithium Ion Batteries Fundamentals and Performance; List of Contributors; Contents; Preface; 1 General Concepts; 1.1 Introduction; 1.2 Design Considerations; 1.2.1 Definitions; 1.2.2 Design Considerations; 1.2.3 Choosing an Electrode; 1.2.4 Anodes; 1.3 Insertion of Lithium into Structures Containing Polyanions; 1.3.1 Close-Packed Oxide-Ion Arrays; 1.3.2 NASICON Frameworks; 1.3.3 Conclusion; References; 2 Cathode Active Materials with a Three-dimensional Spinel Framework; 2.1 Introduction; 2.2 Crystal Structure of Spinel Type Phases; 2.3 Synthesis Technique<br>2.4 Relationship between Discharge Voltage and Thermodynamic Function of the Cathode Materials2.5 Phase Transformation During Intercalation Processes; 2.6 Doped Spinel Phases LiMYMn2-YO4 (M = Co, Cr, Ni) as 4 V-Class Cathode Material; 2.6.1 Doping Effect on Charge-Discharge Behavior of Manganess Spinel; 2.6.2 OCV and Phase Transformation; 2.6.3 Cycling Performance; 2.6.4 Structure Aspects; 2.6.5 The Chemical Diffusion Coefficients of Lithium Ions in LixMyMn2-yO4 (M=Co and Cr); 2.6.6 Low Temperature Behavior; 2.7 Conclusions; References |

3 The Relationship between Structure and Cell Properties of the Cathode for Lithium Batteries3.1 Introduction; 3.2 Titanium Disulfide and Intercalation Chemistry; 3.3 Vanadium Dichalcogenides; 3.4 Layered Oxides; 3.5 Manganese Oxides; 3.6 Vanadium Oxides; 3.7 The Future; References; 4 Design of the Lithium Anode and Electrolytes in Lithium Secondary Batteries with a Long Cycle Life; 4.1 Introduction; 4.2 Lithium Metal Anode; 4.2.1 Protection Films on Lithium Metal Anode; 4.2.2 Cycling Efficiency of Lithium Anode; 4.2.3 Morphology of Deposited Lithium
4.2.4 Mechanism of Lithium Deposition and Dissolution4.2.5 The Amount of Dead Lithium and Cell Performance; 4.2.6 Improvement in the Cycling Efficiency of a Lithium Anode; 4.3 Safety; 4.3.1 Configuration of Prototype Cells; 4.3.2 Cell Performance; 4.3.3 Heat Generation in a Cell-General Considerations; 4.3.4 Incidents During Normal Cycling; 4.3.5 Safety Tests on AA-size Li/a-V205(-P205) Cells; 4.4 Conclusion; References; 5 Development of the Carbon Anode in Lithium Ion Batteries; 5.1 Introduction; 5.2 Structure of Carbon Materials; 5.3 Development of the Carbon Anode
5.4 Intercalation Mechanism of Graphite5.5 Electrochemistry of Soft Carbons; 5.6 Electrochemistry of Hard Carbons; 5.7 Irreversible Surface Reactions; 5.8 Structural Modifications; 5.9 Nitrides as New Anode Materials; 5.9.1 Li7MnN4 and Li3FeN2 (Antifluorite Structure)56,57; 5.9.2 Li3-x CoxN (Li3N Structure)58,59; 5.10 Summary and Conclusions; References; 6 Electrochemical Intercalation of Lithium into Carbonaceous Materials; 6.1 Introduction; 6.1.1 Negative Electrodes in Rechargeable Lithium Batteries; 6.1.2 Lithium/Carbon Intercalation Compounds; 6.1.3 Carbonaceous Host Materials
6.2 Graphitic Carbons as Host for Lithium Intercalation

Sommario/riassunto

Rechargeable Batteries with high energy density are in great demand as energy sources for various purposes, e.g. handies, zero emission electric vehicles, or load leveling in electric power. Lithium batteries are the most promising to fulfill such needs because of their intrinsic discharbe voltage with relatively light weight.This volume has been conceived keeping in mind selected fundamental topics together with the characteristics of the lithium ion battery on the market. It is thus a comprehensive overview of the new challenges facing the further development of lithium ion batteries fro