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Nota di contenuto	Intro -- Li-ion Batteries -- Preface -- Contents -- Introduction -- Brief History of Primary and Secondary Batteries -- General Information on Li-ion Batteries -- Bibliography -- Positive Electrode Materials for "Lithium-ion" Accumulators -- Positive Electrode Materials of "Spinel" Structure -- Positive Electrode Materials with Lithiated Layered Oxide Structure -- Positive Electrode Materials with Olivine Structure -- References -- Negative Electrode Materials -- Negative Electrode Materials: Several Solutions -- Insertion-Intercalation -- Conversion -- Alloying -- Carbon -- Historical Background -- Interest -- Relationship between Structural Characteristics and Performance -- Silicon -- (De) lithiation Mechanisms -- Degradation Mechanisms -- Material Improvement Approaches -- Lithium Metal -- Bibliography -- Organic Electrode Materials -- Different Types of Organic Electrode Materials -- -Extended System (Conducting Polymers) -- Polypyrrole Derivatives (PPy) -- Polythiophene Derivatives (PTh) -- Polyaniline Derivatives (PANI) -- Stable Radical -- Organosulfides & Thioethers -- Carbonyl Functions -- Aromatic Amines -- Implementation Strategies -- Grafting on Inorganic or Organic Support -- Functionalization of Neutral Polymers -- Functionalization of Conducting Polymers -- Stabilization by Physisorption -- Polyanionic Salt Formation -- References -- Electrolytes and Separators -- Liquid Electrolytes --

Lithium Salts and Organic Solvents -- Basic Properties and General Observation -- State of the Art, Its Limitations and Research to Overcome Them -- Lithium Salts and Ionic Liquids -- Separators -- Properties of Separators -- The Separator Market -- Cost and Security -- Bibliography -- Na-ion Batteries: Should/Can Lithium be Replaced? -- General Aspects -- Should Lithium be Replaced? -- Lithium Resources -- Lithium Cost.

Can Lithium be Replaced? Towards a 100% Abundant Element-Based Battery -- The Na-ion Technology -- Brief History -- Operating Principle -- State of the Art -- Negative Electrode Materials -- Graphite -- Hard Carbon -- Non-Carbon Materials -- Positive Electrode Materials -- Layered Oxides -- Polyanionic Materials -- Electrolytes and Interfaces -- Full System Performance -- Outlook -- Low Cost Approach -- High Power Approach -- References -- Metal-Sulfur Batteries -- The Metal-Sulfur Cell -- Advantages and Comparison with Other Technologies -- Working Mechanism of the Metal-Sulfur Cell -- The (Li,Na)-ion Sulfur Cell -- Technology State of the Art and Performances -- Main Actors -- Understanding the Complex Mechanism -- Development Strategies -- All-Solid-State Metal-Sulfur Batteries -- Industrial Actors -- Perspectives and Applications -- Bibliography -- All Solid-State Batteries -- Introduction and Overview -- Main Families of Solid Ionic Conductors -- Polymeric Solid Electrolytes -- Inorganic Solid Electrolytes -- Oxides -- Oxyhalides with Anti-Perovskite Structure -- Borohydrides - Boranes -- Sulfide Solid Electrolytes: Glasses and Ceramics -- Hybrid Solid Electrolytes -- Electrochemical Stability of Solid Electrolytes -- All-Solid-State Cells -- Academic & -- Industrial Players -- Bibliography --

Supercapacitors: From Material to Cell -- Operating Principle -- Carbon/Carbon Based Technology -- Electrode Design and Components -- Current Collector -- Activated Carbons for Supercapacitors -- Sec7 -- Sec8 -- Sec9 -- Sec10 -- Binders -- Sec12 -- Sec13 -- Conductive Additives -- Electrolyte -- Impact of Electrolyte on Performance -- Conductivity -- Ions and Concentration Limitations -- Solvents -- Electrochemical Stability and Ageing -- Electrochemical Stability of Ions and Solvents -- Electrolyte-Related Causes of Ageing. Thermal Stability and Performance -- Toxicity -- Issue with the Substitution of Acetonitrile -- Solid State Electrolyte -- Electrolyte Organization in the Carbon Based Electrodes -- Separators -- Requirement Specifications of Separator -- Cellulose Based and Polymer Based Separators -- Hybrid Systems -- Activated Carbon/MnO₂ System -- Lead Oxide/Activated Carbon System -- NiOOH/Activated Carbon System -- Graphite/Activated Carbon System -- Lithium-ion Capacitor Technology -- Sodium-ion Capacitor Technology -- Potassium-ion Capacitor Technology -- Bibliography --

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Leaching of Waste -- Treatment to Recover and Minimise Ultimate
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Li-ion Batteries Environmental Impacts and Life Cycle Assessment
(LCA).
