CONTENTS

CONTENTS (Continued)

CONTENTS (Continued)

CONTENTS (Continued)

LIST OF FIGURES

LIST OF FIGURES (Continued)

LIST OF FIGURES (Continued)

LIST OF FIGURES (Continued)

LIST OF FIGURES (Continued)

LIST OF ABBREVIATIONS

LIBs	Lithium-ion batteries
EVs	Electric vehicles
Li-ion	Lithium-ion
$LiFePO_4$	Lithium iron phosphate
$LiMBO_3$	Lithium-metal borate
NMC	Lithium nickel manganese cobalt oxide
Li_2O	Lithium oxide
B_2O_3	Boron trioxide
ESD	Energy Storage Devices
EES	Electrochemical Energy Storage
ESS	Energy Storage Systems
FCs	Fuel Cells
LBO	Lithium-borate-based Glass
V_2O_5	Vanadium Pentoxide
Ni-Co	Nickel-Cobalt
Na-ion	Sodium-ion Batteries
K-ion	Potassium-ion Batteries
Ni-Cd	Nickel-Cadmium Batteries
Ni-MH	Nickel-Metal Hydride Batteries
XAS	X-ray Absorption Spectroscopy
In-situ XAS	In-situ X-ray Absorption Spectroscopy
EXAFS	Extended X-ray Absorption Fine Structure
EIS	Electrochemical Impedance Spectroscopy
SEI	Solid Electrolyte Interface
SSE	Solid-State Electrolyte
PVD	Physical Vapor Deposition
CVD	Chemical Vapor Deposition

LIST OF ABBREVIATIONS (Continued)

Pt	Platinum
ODS	Oxide-Dispersion Strengthened
XRD	X-ray Diffraction
CV	Cyclic Voltammetry
SOC	State of Charge
AC	Alternating Current
Ip	Peak Current
NaCl	Sodium Chloride
RC	Resistor-Capacitor
Li_2CO_3	Lithium Carbonate
H_3BO_3	Boric Acid
NiO	Nickel (II) Oxide
Co_3O_4	Cobalt (II, III) Oxide
XANES	X-ray Absorption Near Edge Structure
PP	Polypropylene
$LiPF_6$	Lithium Hexafluorophosphate
EC	Ethylene Carbonate
DMC	Dimethyl Carbonate
$LiBO_3$	Lithium Borate
RT	Room Temperature
CB	Carbon Black
PVDF	Polyvinylidene Fluoride
MW	Molecular Weight
ECCCM	Electric Coin Cell Crimping Machine
BTS	Battery Testing System
CBO	Cross-Beam Optics
SLRI	Synchrotron Light Research Institute
$Li_2B_4O_7$	Lithium Tetraborate

LIST OF ABBREVIATIONS (Continued)

$Li_6B_4O_9$	Lithium Hexaborate
$LiBO_2$	Lithium Metaborate
B_2O_3	Boron Trioxide
ICE	Initial Coulombic Efficiency
mAh/g	Milliampere-hour per gram
mWh/g	Milliwatt-hour per gram
αV_2O_5	Alpha-phase Vanadium Pentoxide
δ-LiV_2O_5	Delta-phase Lithium Vanadium Pentoxide
γ-$Li_2V_2O_5$	Gamma-phase Lithium Vanadium Pentoxide
Li_2CoNiO_4	Lithium Cobalt Nickel Oxide
Li_2CoO_2	Lithium Cobalt Oxide
ΔE	Energy difference at the absorption edge
K-edge	Absorption edge related to the K-shell
CoO	Cobalt (II) Oxide
Co_3O_4	Cobalt (II, III) Oxide
VO_2	Vanadium (IV) Oxide
S_0^2	Scattering amplitude reduction factor
σ^2	Debye-Waller factor
ΔE^0	Energy shift at the absorption edge
N	Coordination number
TM-XAS	Transition Metal X-ray Absorption Spectroscopy
Li^+	lithium ions
ΔEp	The redox peak separation
$Li_6B_4O_9$	Lithium Hexaborate