

1. Record Nr.	UNINA9910597153803321
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Titolo	Modeling transport properties and electrochemical performance of hierarchically structured lithium-ion battery cathodes using resistor networks and mathematical half-cell models / / Oleg Birkholz
Pubbl/distr/stampa	Karlsruhe : , : KIT Scientific Publishing, , 2022
Descrizione fisica	1 online resource (xi, 209 pages)
Disciplina	731.42
Soggetti	Modeling
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Sommario/riassunto	Hierarchically structured active materials in electrodes of lithium-ion cells are promising candidates for increasing gravimetric energy density and improving rate capability of the system. To investigate the influence of cathode structures on the performance of the whole cell, efficient tools for calculating effective transport properties of granular systems are developed and their influence on the electrochemical performance is investigated in specially adapted cell models.