





Specifically if the cathode and anode are known materials how do you calculate the theoretical capacity and energy density of the full cell? For example if you have a Lithium Iron Phosphate cathode and graphite anode.









Comparing the calculated theoretical capacity of Li (3861 mAh g -1), Li metal anode holds about 10 folds higher specific capacity than that of the graphite. However, the major capacity that dictates the energy density of the battery is the discharge capacity that depends on the cathode.

THEORETICAL CAPACITY OF LITHIUM ION BATTERY





Since the commercial success of lithium-ion batteries (LIBs) and their emerging markets, the quest for alternatives has been an active area of battery research. Theoretical capacity, which is directly translated into specific capacity and energy defines the potential of a new alternative.

Li-ion battery materials: present and future. This review covers key technological developments and scientific challenges for a broad range of Li-ion battery electrodes. Periodic table and potential/capacity plots are used to compare many families of suitable materials.



This review discusses the fundamental principles of Li-ion battery operation, technological developments, and challenges hindering their further deployment. The review not only discusses traditional Li-ion battery materials but also examines recent research involved in developing new high-capacity anodes, cathodes, electrolytes, and separators.

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Key Terms. battery, cell design, energy density, energy storage, grid applications, lithium-ion (li-ion), supply chain, thermal runaway. 1. Introduction. This chapter is intended to provide an overview of the design and operating principles of Li-ion batteries.



The Theoretical capacity of a cell can be calculated by Faraday's law: Q theoretical = $(nF) / (3600^*Mw)$ mAh g -1. Where n is the number of charge carrier, F is the Faraday constant