

# Lithium-ion batteries: Science and Technologies

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Energy storage is a broad and rapidly developing research area that has become a primary focus of the scientific community. Batteries are a clean and an appropriate method to store energy for a long time. My presentation provides a brief overview of Lithium ion batteries (LIB) as a widely used power source for many commercial applications, with higher energy densities, higher operating voltages, lower self-discharge and lower maintenance requirements, as compared to the other various types of rechargeable batteries (nickel–cadmium and nickel-metal hybrid).

Eventually, in 1991, Sony introduced the first commercial lithium-ion cell based on  $\text{LiCoO}_2$  as cathode materials, with graphite or carbonaceous materials as anode materials. Since then, there has been an extraordinary amount of work on all aspects of the lithium-ion chemistry, battery design, manufacture and applications. One part of this presentation describes the development of lithium-ion batteries in terms of the most interesting series of electrode-materials. Indeed, the mention of a lithium-ion battery can imply dozens of different chemistries, both commercial and developmental. Hence, in this presentation I will provide some insights on the recent research and development on Lithium-ion batteries.

