

## Highlights on latest battery technology achievements & challenges

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After introducing our battery activity, the presentation will focus on high energy density solutions. We will discuss how to push the limits of Li-ion batteries, and will detail the technologies offered to go further, with a specific attention to the Li/Sulfur technology. We will continue our journey through the batteries by considering the solutions to improve safety, cost, life,...

Firstly reported in the 80's, rechargeable lithium/sulfur (Li/S) batteries have received ever-increasing attention since 10 years. Indeed, elemental sulfur (S8) is a promising positive electrode material due to its high theoretical specific capacity of  $1675 \text{ mAh.g}^{-1}$ . Assuming full conversion of S8 to  $\text{Li}_2\text{S}$ , complete Li/S cells are expected to reach practical gravimetric energy densities from 300 up to 600  $\text{Wh.kg}^{-1}$ . Those values, combined with low cost, non-toxicity and environmental abundance of sulfur, make Li/S batteries one of the most promising candidates for next-generation energy storage systems. A review of the recent developments done in our laboratory will be presented, at different levels starting from the optimization of coin cell components up to assembly of prototypes, in addition to the last characterization methods that have been applied via *in situ* and *in operando* methods to allow deeper understanding of the Li/S technology.