



"Electrochemical energy storage via batteries: The importance of materials"

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Research's progresses in rechargeable batteries are driven by ever increasing demands for portable electronic devices as well as for powering electric vehicles and providing load-leveling for mass storage of renewable energy. Li-ion batteries are the systems of choice for the aforementioned applications. Therefore, for this to fully happen, new sustainable materials, new concepts and new chemistries are sorely needed, and this is what this presentation will address. This is what this presentation will focus on.

Firstly, regarding new concepts, we will show how model materials have enabled the discovery of a new Li reaction mechanism that involves the anionic network with the reversible formation of dimers (O-O), hence offering a transformational approach for creating electrode materials with exacerbated capacities for the Li-ion technology which solid state version is receiving increasing interest. Secondly, concerning new sustainable chemistry, our new findings with the Na-ion chemistry which enlists novel materials/electrolyte designs together with the assembly of 18650 prototypes will be presented. Through these examples, the importance of materials design together with the mastering of their morphologies and processing will be emphasized prior to discuss future aspects of battery research as personally envisioned.