Pedro Gómez-Romero

Catalan Institute of Nanoscience and Nanotechnology, ICN2 (CSIC-BIST) Campus UAB, 08193 Bellaterra (Barcelona), Spain pedro.gomez@icn2.cat

The unstoppable trend to electrification requires new and improved energy storage devices and systems from the mW to the MW. Lightweight and compactness (as demanded from LIBs 20 years ago) are not enough anymore. These days we need a variety of technologies, devices and materials all of which should at least add i) much extended cycle life, ii) low cost and iii) eco-friendliness to their list of strengths.

In our lab we have pioneered the concept of hybrid materials for hybrid energy storage devices. This concept is strongly based on the use of inorganic nanoclusters dispersed in various nanocarbons. These nanoclusters have the electroactivity of parent extended oxides but avoid many of their drawbacks, allowing for a fast charge-discharge, and, more importantly, much improved cyclability. We will present here an overview of this line of work with emphasis on understanding how nano helps to improve the final performance of energy storage devices.

I look forward to a lively discussion on the ground-breaking milestones needed to succeed in our race (against time, not among ourselves) to reach an energy-sustainable society.