

A ascensão do armazenamento eletroquímico de energia

Electrochemical energy storage on the rise

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Resumo: Interest in electrochemical energy storage (EES) systems has dramatically expanded over the past 20 years due to increased demand for portable power. This expansion was initially induced by consumer electronics. Recently, in the last 10 years, there has been a paradigm shift with an expansion of EES for large scale systems brought about by the development of renewable sources, such as wind and solar energy, stabilization of the electric distribution network and electric vehicles^{1,2}. Obviously the driving force behind this technological innovation is not just oil supply - let us recall the quote from Sheikh Ahmed Zaki Yamani in 1973, when he was OPEC's first secretary-general and minister of oil and mineral resources in Saudi Arabia: "The Stone Age did not end for lack of stone. And oil will not end because of lack of oil (The Economist, 23.10.2003) - but also to the fundamental interest of reducing global warming by using technologies with low environmental impact. Much of the development has been directed to lithium-ion batteries, but there has also been significant interest beyond lithium technologies³, including lithium/oxygen, lithium/sulfur, sodium-ion and magnesium batteries. While these systems utilize many different electrode materials and electrolyte solutions, a common limitation for all of them lay in ionic transport across the interfaces. In addition to the different types of primary and rechargeable batteries, the forms of energy storage related to high energy density carriers have developed rapidly. One can enumerate in this case the electrolysis of water (hydrogen production), fuel cells, CO₂ reduction, among others. In this presentation will be analyzed the disruptive impacts already provoked by these technologies, mainly those related to metal-ion batteries and electrochemical capacitors as well, a future projection of these technologies will be discussed regarding the development of new materials.

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