

F. Béguin, E. Frackowiak (eds): Supercapacitors – Materials, Systems, and Applications

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Although a scientist at a battery conference recently called supercapacitors the worst combination of batteries and capacitors—because they apparently combine the limitations of capacitors at high power and the limitations of batteries at high energies—these devices are obviously part of the future of the utilization of electric energy. Taking the pun in reverse: supercapacitors bring out the best from capacitors and batteries with “batteries” of high power and “capacitors” of high energy. At least, that is the aim of most research in this extremely active area where Ragone plots frequently seem to imply the imminent merger of both fields and devices. Publishing a book providing an overview of such a highly volatile field with much scientific activity is a risky enterprise. Too specific content, details too much subject of current debate or even controversial or speculative may doom the product and move it rapidly into the dustbins of libraries.

The present editors—both well known in the field of supercapacitors with wide expertise and publication record ranging from materials science up to complete devices have taken a different approach: They start with an introductory chapter on general principles of electrochemistry. Many terms, models, phenomena and even some experimental methods are introduced. The latter are described in detail in a later chapter. A further initial chapter again briefly introduces capacitors. In subsequent chapters, both double-layer capacitor electrodes and pseudocapacitive materials are discussed from all

conceivable angles. Devices—both symmetric and asymmetric as well as hybrid ones—are reviewed. The final chapters—and a substantial part of the book—are devoted to practical aspects: manufacturing, module design, testing, reliability and finally market perspectives. In these chapters, numerous applications already visible on the market from small appliances to electric trains support the initial statement regarding the future of supercapacitors and their role in a slowly changing energy landscape. And in addition, many aspects frequently overlooked in scientific publications barely looking beyond the first few thousand cycles at room temperature are addressed raising awareness for possible problems and challenges generously overlooked in the laboratory.

The book is carefully written, generously illustrated and contains a balanced mix of fundamentals and applications with enough details to illustrate the major points without getting lost in details which indeed may turn this book into a dated one soon. It is a must for libraries of institutions somehow related to electric energy research, it is certainly a necessity for places where bachelor and master courses dealing with electric energy technology are offered and it is a welcome addition to the bookshelf of the scientist in this field searching for a reference book. For the latter purpose, the very rich index is welcome, whereas a more condensed, shorter table of contents than the present one would provide an easier access to the book.

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