

## Special Issue

# Advances in Electrochemical Energy Storage Materials and Devices

### Message from the Guest Editors

The most promising technology for balancing the electric grid and more effectively shifting from fossil fuels to renewable energy from the wind or sun are batteries and supercapacitors (electrochemical energy storage devices). Furthermore, because of its high energy density, batteries are employed to power portable electronics and hybrid cars. Due to decreased power density, significant capacity fading at high charge/discharge rates, and restricted cyclability, battery technology is severely hampered (lifespan). Supercapacitors, unlike batteries, offer good power rates and cyclability but have lower energy densities. Because of these flaws in batteries and supercapacitors, they are ineffective when used independently, especially when great power and energy density are desired at the same time. Using them together also limits the size of electrical gadgets. The concept of fully integrated rechargeable hybrid battery–supercapacitor (supercapbattery) electrical energy storage devices is a promising approach to developing next-generation energy-storage systems.

---

### Guest Editors

Dr. Ntuthuko Wonderboy Hlongwa

Institute for Nanotechnology and Water Sustainability (iNanoWS),  
College of Science, Engineering and Technology, Science Campus,  
University of South Africa, Roodepoort, FL1709, South Africa

Prof. Dr. Mesfin Abayneh Kebede

Institute for Nanotechnology and Water Sustainability (iNanoWS),  
College of Science, Engineering and Technology, Science Campus,  
University of South Africa, Roodepoort, FL1709, South Africa

---

### Deadline for manuscript submissions

closed (30 October 2025)



## Processes

---

an Open Access Journal  
by MDPI

---

Impact Factor 2.8  
CiteScore 5.5



[mdpi.com/si/232369](https://mdpi.com/si/232369)

*Processes*  
Editorial Office  
MDPI, Grosspeteranlage 5  
4052 Basel, Switzerland  
Tel: +41 61 683 77 34  
[processes@mdpi.com](mailto:processes@mdpi.com)

[mdpi.com/journal/  
processes](https://mdpi.com/journal/processes)





# Processes

---

an Open Access Journal  
by MDPI

---

Impact Factor 2.8  
CiteScore 5.5



[mdpi.com/journal/  
processes](https://mdpi.com/journal/processes)



## About the Journal

### Message from the Editor-in-Chief

You are invited to contribute either a research article or a comprehensive review for consideration and publication in *Processes* (ISSN 2227-9717). *Processes* is published in open access format – research articles, reviews, and other content are released on the internet immediately after acceptance. The scientific community and the general public have unlimited, free access to the content. As an open access journal, *Processes* is supported by the authors and their institutes through the payment of article processing charges (APCs) for accepted papers. We would be pleased to welcome you as one of our authors.

---

### Editor-in-Chief

Prof. Dr. Giancarlo Cravotto  
Department of Drug Science and Technology, University of Turin, Via P.  
Giuria 9, 10125 Turin, Italy

---

### Author Benefits

#### Open Access:

free for readers, with article processing charges (APC) paid by authors or their institutions.

#### High Visibility:

indexed within Scopus, SCIE (Web of Science), Ei Compendex, Inspec, AGRIS, and other databases.

#### Journal Rank:

CiteScore - Q2 (Chemical Engineering (miscellaneous))