

Editorial: Advancing Sustainability Through Chemistry and Materials Science

Special Issue: Sustainable Materials and Chemistry for Energy and Environmental Applications.

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About the Guest Editor: After earning a bachelor of science degree from Hampden-Sydney College, Dr. Abu-Omar received a Ph.D. from Iowa State University in 1996 (under the tutelage of the late James Espenson.) Mahdi was an NIH Postdoctoral Fellow at Caltech with Harry Gray. He held faculty positions at Purdue University and UCLA. He is also the founder of Spero Renewables LLC, a technology company focused on delivering renewable and cost-effective alternatives to petrochemicals. Among his honors, Dr. Abu-Omar received the ACS Award for Affordable Green Chemistry in 2022 and was elected a Fellow of the American Association for the Advancement of Science (AAAS) in 2012.



It is with great pride that we introduce this Special Issue of An-Najah University Journal for Research – A (Natural Sciences), titled "Sustainable Materials and Chemistry for Energy and Environmental Applications." As the global community faces the escalating pressures of climate change and resource scarcity, the roles of chemistry and materials science have never been more critical. This special issue brings together a curated collection of original, interdisciplinary research designed to address the challenges in modern energy systems, environmental sustainability, and the development of advanced functional materials.

The contributions within this issue represent the cutting edge of sustainable innovation. Our authors have explored a diverse array of topics, spanning:

- **Nanomaterials and Green Synthesis:** Developing efficient, low-impact methods for creating the building blocks of future technologies.
- **Catalytic Strategies:** Advancing cross-coupling and carbonylation techniques to streamline chemical manufacturing.
- **Renewable Energy & Storage:** Integrating sustainable energy sources and enhancing the storage capacities required for a stable grid.
- **Bioenergy and Agriculture:** Leveraging waste-to-energy solutions, understanding soil microbial dynamics under climate variation, and promoting sustainable agricultural practices.
- **The Built Environment:** Assessing green building performance to reduce the carbon footprint of our infrastructure.

Together, these studies bridge the gap between fundamental science—including chemistry, biology, and physics—and the applied realms of engineering and environmental science. By connecting these disciplines, this issue seeks to support the development of practical, scalable solutions that are essential for a transition to a sustainable future.

An-Najah University Journal for Research – A (Natural Sciences) remains deeply committed to publishing rigorous research that advances knowledge across the natural and applied sciences. The journal serves as a trusted regional and international platform for scientific exchange, upholding the highest standards of integrity. Every article in this issue has undergone a strict peer-review process to ensure scientific excellence and ethical merit.

As a fully Open Access journal, we believe that knowledge should have no borders. All manuscripts in this issue are published online immediately upon acceptance, making them freely and permanently accessible to researchers, students, and policymakers worldwide without subscription or registration fees. This digital presence is complemented by our quarterly print publication.

The quality of our contributions is reflected in the journal's continued growth and its indexing in databases such as Scopus and the Directory of Open Access Journals (DOAJ). With a current CiteScore of 1.0, the journal continues to earn the confidence of the global scientific community, signaling an upward trajectory in impact and reach.

We would like to thank the authors for their visionary contributions and the reviewers for their diligent efforts in maintaining the quality of this issue. We hope that this collection of research serves as a catalyst for further innovation and collaboration in the pursuit of a better and sustainable future.