EDITORIAL

Shaping the Future of Environmental Adsorption

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Abstract

Adsorption plays an indispensable role in addressing critical environmental challenges, including water purification, air quality control, and resource recovery. Despite its central importance, adsorption research remains widely dispersed across journals focused on chemistry, materials science, environmental science, and chemical engineering. *Environmental Adsorption Research* has been established to provide a dedicated and authoritative platform for advancing adsorption science and engineering in environmental contexts. This editorial outlines the journal's objectives, scope, and vision, emphasizing its commitment to scientific integrity and its role in addressing contemporary environmental challenges. The journal aims to consolidate the field, foster interdisciplinary collaboration, and ensure the highest standards of research quality and ethical publishing.

Keywords: adsorption, pollution control, resource recovery.

1 Introduction

Adsorption plays a pivotal role in addressing a wide range of contemporary environmental challenges, including water and wastewater treatment, air pollution control, and resource recovery. Despite its broad applicability and continued advancement, research in environmental adsorption has historically been disseminated across diverse journals primarily devoted to chemistry, materials science, environmental science, and chemical engineering. This dispersion has often limited the visibility of adsorption-specific advances and hindered the consolidation of knowledge within a focused community. *Environmental Adsorption Research* (EAR) has been established to provide a dedicated, authoritative platform for the dissemination of high-quality studies in this vital domain. The journal seeks to serve as the central forum for researchers and practitioners engaged in advancing adsorption science and its environmental applications.

2 Scope

The journal encompasses the full spectrum of research activities related to environmental adsorption. Areas of interest include, but are not limited to:

- Fundamental studies of adsorption phenomena, including thermodynamics, kinetics, surface interactions, and mass transfer mechanisms.
- Design, synthesis, and characterization of adsorbents for environmental applications.

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- Experimental, theoretical, and computational modeling of adsorption processes across scales.
- Applications of adsorption in water and wastewater treatment, air purification, soil remediation, and resource recovery.
- Integration of adsorption with other separation and treatment technologies.

Through this focused scope, the journal aims to facilitate the exchange of knowledge, promote interdisciplinary collaboration, and accelerate the translation of adsorption research into environmental technologies and practices.

3 Addressing Contemporary Environmental Challenges

Adsorption is increasingly recognized as a critical technology for addressing emerging and persistent contaminants that pose substantial risks to environmental and public health. Among the most pressing concerns are per- and polyfluoroalkyl substances (PFAS) [1, 2] and nano- and microplastics [3, 4], which have been detected in drinking water sources and natural ecosystems worldwide. Adsorption-based treatment technologies have demonstrated considerable potential for the removal of these contaminants [5–7], often complementing or surpassing conventional treatment methods in terms of efficiency, selectivity, and scalability.

Beyond these priority contaminants, adsorption plays a pivotal role in mitigating a broad spectrum of pollutants, including micropollutants, heavy metals, and volatile organic compounds. Ongoing advances in the development of high-performance adsorbent materials—such as engineered carbons, metal–organic frameworks, and hybrid composites—have substantially expanded the scope, effectiveness, and applicability of adsorption technologies in environmental remediation.

A particularly important application of adsorption is in mitigating greenhouse gas emissions through CO_2 capture. Adsorption-based carbon capture technologies offer key advantages, including lower energy demand, process flexibility, and compatibility with large-scale deployment. Although substantial engineering challenges remain, these systems hold considerable promise for achieving cost-effective and energy-efficient carbon capture [8]. As such, adsorption is expected to play a central role in the portfolio of climate change mitigation technologies.

The breadth and growing importance of these applications underscore the need for continued innovation and rigorous scientific inquiry in adsorption science and technology. By providing a dedicated platform for advancing fundamental understanding, fostering technological innovation, and facilitating knowledge exchange, the journal aims to accelerate the development of effective and sustainable adsorption-based solutions to address these urgent and evolving environmental challenges.

4 Commitment to Scientific Integrity

The integrity of the scientific record is a foundational principle of scholarly publishing. In recent years, the infiltration of fabricated and low-quality manuscripts produced by paper mills has emerged as a serious and growing threat to the reliability of the scientific literature [9]. Recognizing this challenge, EAR is committed to rigorous editorial and peer-review standards to safeguard the quality and authenticity of its content. The editorial team will employ robust screening protocols, careful methodological scrutiny, and ethical oversight to ensure that all published articles meet the highest standards of scientific rigor, transparency, and reproducibility. The journal will not compromise on these principles, irrespective of topical trends or perceived novelty.

5 Vision and Outlook

EAR aspires to become the leading international journal in its field, fostering a coherent and dynamic scholarly community devoted to adsorption-based environmental solutions. By providing a dedicated platform, the journal seeks to:

- Consolidate and elevate research in environmental adsorption, which has long been fragmented across disciplines.
- Encourage interdisciplinary collaboration among chemists, environmental scientists, materials engineers, chemical engineers, and policymakers.
- Support the development of evidence-based technologies and policies informed by sound adsorption science.
- Cultivate an inclusive environment that welcomes contributions from both established and emerging researchers.

6 Conclusion

The launch of EAR represents a significant step toward strengthening the identity and visibility of environmental adsorption as a distinct and impactful research field. By consolidating the community, upholding rigorous scientific standards, and focusing on the most pressing environmental challenges, the journal seeks to shape a more coherent and impactful research landscape. We invite the global scientific community to contribute their most rigorous and innovative work to EAR. Through collective commitment to excellence and integrity, the journal will serve as a trusted, enduring, and influential reference point for adsorption research with environmental relevance.

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Ethical Approval and Consent to Participate

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