

Special Issue

Smart and Sustainable Hydrogels for Environmental Applications

Message from the Guest Editor

Hydrogels are emerging as versatile biomaterials capable of addressing environmental challenges through sustainable design. Their three-dimensional polymeric networks provide high water retention, tunable mechanics, and chemical adaptability, making them ideal for remediation, water purification, controlled nutrient release, and eco-friendly construction materials. This Special Issue highlights recent advances in the design, synthesis, characterization, and environmental applications of smart and sustainable hydrogels. Topics include biopolymer-based, stimuli-responsive, and recyclable systems; adsorption and catalytic processes for pollutant removal; and integration in sustainable technologies. Studies on structure–property relationships, modeling, and performance optimization under environmental conditions are also encouraged. By uniting materials science, chemistry, biotechnology, and environmental engineering, this issue aims to showcase hydrogels as functional materials driving cleaner technologies and a circular bioeconomy.

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