



catalysts



Special Issue Reprint

Environmentally Friendly Catalysts for Energy and Water Treatment Applications

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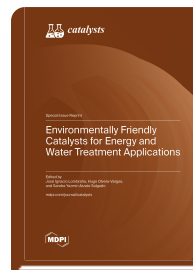
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Water and energy are crucial for sustainable development, yet both face growing challenges due to industrial growth, population increase, and resource depletion. With less than 0.03% of Earth's water being potable and conventional treatment often failing against persistent pollutants, innovative solutions are needed. Catalysis plays a key role in water purification, but its safety and sustainability must be ensured. This volume highlights recent advances in environmentally friendly catalysts (EFCs) for advanced oxidation processes (AOPs), focusing on wastewater remediation, drinking water production, and energy efficiency. Key contributions address the removal of pharmaceuticals (e.g., diclofenac, paracetamol) and emerging contaminants like nanoplastics, dyes, and trace organics. It also explores photocatalytic pathogen removal and trace pollutant elimination in drinking water. Energy-efficient catalytic systems utilizing solar energy, activated oxidants, and energy storage are also discussed. Notable examples include iron-based ligands from metallurgical slag, in line with circular economy principles, and graphitic carbon materials for both water purification and solar hydrogen production. The book covers various AOP techniques, including homogeneous photo-Fenton systems, robust heterogeneous catalysts, and photocatalysis using materials like graphitic carbon nitride and titanates. These contributions demonstrate how environmentally friendly catalysis can offer innovative, safe, and scalable solutions to global water challenges.



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