





Preface

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In counties like South Africa, the waste PET stream has posed a serious environmental problem, and the current recycling of waste PET remains as low as 30%. The waste PET recycling industries such as PETCO and Extrupet (South Africa) are struggling to implement innovative processes to operate profitably.

Furthermore, metal-organic frameworks (MOFs) are a new class of porous materials. The MOFs-based water treatment promises to provide cost-effective solutions to deal with polluted water. However, the high costs of MOFs production have created a challenge for its effective implementation. Regardless, cross-cutting advances in materials and engineering will help to solve these societal challenges. To maintain a world-class research and development associated with human capacity in South Africa, this multi-disciplinary and transdisciplinary work has been strengthened by the basic applied research continuum under the frame of South Africa (NRF)/Poland (NCBR) Joint Science and Technology Research Collaboration.

Since a circular economy refers to an economic system aimed at eliminating waste and the continual use of resources, this monograph will discuss the potential circular economy for waste PET towards water treatment through the elimination of the waste PET streams and continual use of recycled resources. It starts from the perspective on waste PET recycling in South Africa and the real market-driven needs. The concept of MOFs production from waste PET is approved through a series of process development and optimisation work. Then, application-oriented customisation is conducted based on the MOF materials with tailored properties.

Lastly, the techno-economic feasibility assessment on the viability of using waste PET (trays and coloured bottles) to produce MOFs materials is carried out. These interesting topics address some of the needs of the real world and provide new insights for readers, stakeholders, and decision-makers with the formation, characterisation, and utilisation of waste PET-derived MOFs materials. More importantly, this project can be

Waste PET-MOF-Cleanwater

a critical stepping-stone, enabling the wider MOFs-based practices in our real world.

Editors

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