1. Record Nr. UNINA9910639975103321

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Titolo	Waste PET-MOF-Cleanwater : Waste PET-Derived Metal-Organic Framework (MOFs) as Cost-Effective Adsorbents for Removal of Hazardous Elements from Polluted Water
Pubbl/distr/stampa	Johannesburg, : UJ Press, 2022
Descrizione fisica	1 electronic resource (212 p.)
Soggetti	Industrial chemistry & manufacturing technologies
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Sommario/riassunto	In counties like South Africa, firstly, the waste PET stream has posed a serious problem to the environment, and the current recycling of waste PET remains as low as 30%. The waste PET recycling industries such as PETCO & Extrupet (South Africa) are struggling to implement innovative processes to make cooperate more profitable. Secondly, metal-organic frameworks (MOFs) as a new class of porous materials, the MOFs-based water treatment holds the promises to provide cost-effective solutions dealing with the polluted water. However, the high costs of MOFs production have raised a challenge for its effective implementations. Given that, cross-cutting advances in materials and engineering will help to solve those societal challenges. To maintain the world-class research and development associated with human capacity in South Africa, this multidisciplinary and transdisciplinary work has been strengthened along with the basic-applied research continuum under the frame of South Africa (NRF)/Poland (NCBR) Joint Science and Technology Research Collaboration.