

processes

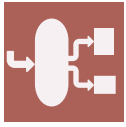
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Section

Environmental and Green Processes



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Section Information

One of the challenges faced by the research community relates to the development of production processes with reduced environmental impacts. The Green Processes section of the journal *Processes* is the selected forum for the publication of significant original and high-quality research, as well as reviews related to new and transformative environmentally friendly and more efficient systems. The topics of interest include but are not limited to new processes with reduced emissions, processes for environmental remediation, processes for distributed and small-scale production, biomass-related processes, electrification of process industry, LCA analysis to compare cleaner processes, etc. All manuscripts submitted for publication under this Section will undergo the high-quality peer-review process of the journal *Processes* and, if accepted, will be rapidly published online.



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Selected Papers

DOI:10.3390/pr10040743

Oily Wastewater Treatment: Methods, Challenges, and Trends

Authors: Alexandre D’Lamare Maia de Medeiros, Cláudio José Galdino Silva Júnior, Júlia Didier Pedrosa Amorim, Italo José Batista Durval, Andréa Fernanda de Santana Costa and Leonie Asfora Sarubbo



Abstract: The growing interest in innovations regarding the treatment of oily wastewater stems from the fact that the oil industry is the largest polluter of the environment. The harm caused by this industry is seen in all countries. Companies that produce such wastewater are responsible for its treatment prior to disposal or recycling into their production processes. As oil emulsions are difficult to manage and require different types of treatment or even combined methods, a range of environmental technologies have been proposed for oil-contaminated effluents, such as gravity separation, flotation, flocculation, biological treatment, advanced oxidation processes, and membranes. Natural materials, such as biopolymers, constitute a novel, sustainable solution with considerable potential for oily effluent separation. The present review offers an overview of the treatment of oily wastewater, describing current trends and the latest applications. This review also points to further research needs and major concerns, especially with regards to sustainability, and discusses potential biotechnological applications.



DOI:10.3390/pr10010150

Modified Activated Carbon for Copper Ion Removal from Aqueous Solution

Authors: Wei-Sheng Chen, Yun-Chung Chen and Cheng-Han Lee



Abstract: Because of increasing environmental awareness, it is becoming more important to remove harmful elements from water solutions. This study used activated carbon (AC) derived from waste wood-based panels as the base material, oxidized with nitric acid (OAC), and grafted with iminodiacetic acid (IDA-OAC) to improve the adsorption capacity and affinity for metals. The characterization of AC, OAC, and IDA-OAC was conducted via FTIR, SEM, N_2 adsorption and desorption analysis, elemental analysis, Boehm titration, and point of zero charge (PZC). The instrument studies proved the modified increasing of the functional groups of the adsorbents. Moreover, batch and column experiments were conducted to evaluate the ability of the three adsorbents to remove copper ions from aqueous solution. In batch sorption, IDA-OAC had the highest adsorption capacity (84.51 mg/g) compared to OAC (54.74 mg/g) and AC (24.86 mg/g) at pH 5. The breakthrough point ($C_t/C_i = 0.05$) of copper ions for IDA-OAC occurred much later than AC in the column experiment (AC = 19 BV, IDA-OAC = 52 BV). The Langmuir isotherm and pseudo-second-model kinetics modeling could better fit with the data obtained from the batch sorption of AC, OAC, and IDA-OAC. The significant capacity and reusability of IDA-OAC displayed high applicability for water treatment.

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