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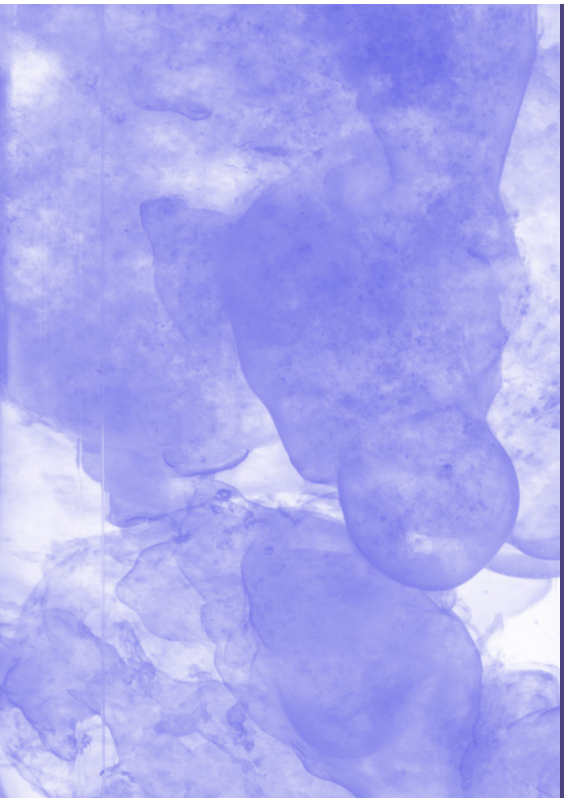

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Section Information

The “Environmental Sciences” Section of *Applied Sciences* is open to receive high quality original articles and reviews related to environmental conservation, environmental technologies, environmental pollution and remediation, environmental quality and treatment, monitoring and modelling of environmental systems. All manuscripts submitted for publication in this section will undergo a thorough peer review process and will be published rapidly online on acceptance.

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Selected Papers

Mercury Levels in Sediment, Water and Selected Organisms Collected in a Coastal Contaminated Environment: The Marano and Grado Lagoon (Northern Adriatic Sea, Italy)

Authors: Nicola Bettoso, Federico Pittaluga, Sergio Predonzani, Antonella Zanello and Alessandro Acquavita

Abstract: Mercury (Hg) is a global pollutant capable of bioaccumulates/biomagnifies along the trophic chain and posing concerns for organisms and humans. The historical mining in Idrija (NW Slovenia) and the more recent activity of a chlor-alkali plant (CAP) sited in Torviscosa (NE Italy) causes diffuse Hg contamination in the Marano and Grado Lagoon (MGL, northern Adriatic Sea, Italy). Despite the importance of fishing and aquaculture for local inhabitants, knowledge of the Hg content of MGL fish is still scarce and fragmentary. This paper reports the results obtained from the collection of sediments, water, and biota during the implementation of the WFD/2000/60/CE.

https://doi.org/10.3390/app13053064

Penicillium spp. XK10, Fungi with Potential to Repair Cadmium and Antimony Pollution

Authors: Yiying He, Chaoyang Li, Zhongyu Sun, Wan Zhang, Jianing He, Yunlin Zhao, Zhenggang Xu and Weiping Zhao

Abstract: Soil heavy-metal pollution is one of the most important environmental problems in the world, and seriously endangers plant growth and human health. Microbial remediation has become a key technology in the field of soil heavy-metal remediation due to its advantages of being harmless, green and environmental. In this study, a fungus Penicillium spp. XK10 with high tolerance to cadmium (Cd) and antimony (Sb) was screened from mine slag, and its adsorption characteristics to heavy metals under different environmental conditions were studied. The results showed that at pH0 = 6, C0 (Cd) = 0.1 mM, and the adsorption time was 4 days, the maximum removal rate of cadmium by XK10 was 32.2%. Under the conditions of pH0 = 4, T = 7d, and the initial antimony concentration of 1 mM, the removal rate of antimony by XK10 was the highest, which was 15.5%. This study provides potential microbial materials for bioremediation of heavy metal-contaminated soils.

https://doi.org/10.3390/app13031228

Ten Questions Concerning Indoor Environmental Quality (IEQ) Models: The Development and Applications

Authors: Dadi Zhang, Kwok-Wai Mui and Ling-Tim Wong

Abstract: In the past two decades, with advances in data collection and in analytical techniques and tools, there has been a significant increase in research on indoor environmental quality (IEQ) assessment. To better understand the relationships between the overall IEQ performance and individual IEQ aspects, namely, indoor air quality, thermal comfort, acoustic quality, and visual quality, IEQ models have been developed by many previous studies. In this paper, the IEQ models proposed in the literature in the period from 2001 to 2022 are examined and summarized into ten questions, including but not limited to indicator selection, data collection, analysis methods, interpretation, and implication. The proposed answers aim to provide insight into current studies on IEQ models and identify gaps for future research

https://doi.org/10.3390/app13053343

Recycled Carbon Fibers with Improved Physical Properties Recovered from CFRP by Nitric Acid

Authors: Asuka Sakai,Winarto Kurniawan and Masatoshi Kubouchi

Abstract: To effectively reuse a large amount of Carbon Fiber Reinforced Plastics (CFRP) waste, the carbon fibers should be able to be recovered without degrading their quality. In this report, we developed a new approach to recover carbon fibers from CFRPs with improved physical properties compared to virgin carbon fibers with an environmentally friendly recycling method using nitric acid. Following the decomposition of the CFRP waste in nitric acid at 80 °C, both recycled carbon fibers and decomposed resin were recovered. The obtained recycled carbon fibers showed 1.4 times higher tensile strength and 2.2 times higher interfacial shear strength to resin compared to virgin carbon fibers. TEM-EDX analysis showed a decrease in the abundance of voids existing in the carbon fiber surface layer and new polar functional groups caused by nitric acid existing inside the voids, leading to increased tensile strength. Furthermore, XPS analysis showed that the interfacial shear strength improved due to the formation of new polar functional groups due to nitric acid. The possibility of applying recycled carbon fibers to CFRP products was shown by elucidating the mechanism that expressed its physical properties during the recycling process, leading to a novel approach to realizing closed-loop recycling.

https://doi.org/10.3390/app13063957

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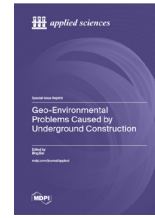

Geo-Environmental Problems Caused by Underground Construction

GIS Applications in Green Development

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MDPI
Grosspeteranlage 5
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