LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : JURNAL ILMIAH

Judul Jurnal Ilmiah (Artikel)	:	Mercury removal using modified activated carbon of peat soil and coal in simulated landfill leachate
Jumlah Penulis	:	6 orang (Mochammad Arief Budihardjo, Yudha Gusti Wibowo, Bimastyaji Surya Ramadan, Muhamad Allan Serunting, **Eflita Yohana,** Syafrudin)
Status Pengusul	:	penulis Ke-5
Identitas Jurnal Ilmiah	:	a. Nama Jurnal : Environmental Technology & Innovation b. Nomor ISSN : 2352-1864 c. Vol, No., Bln Thn : Volume 24, November 2021, 102022 d. Penerbit : Elsevier BV e. DOI artikel (jika ada) : https://doi.org/10.1016/j.eti.2021.102022 f. Alamat web jurnal : https://www.sciencedirect.com/science/article/pii/S2352186421006702 Alamat Artikel : https://www.sciencedirect.com/science/article/pii/S2352186421006702 g. Terindex : Scopus, Q1

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Total = (100%)	**39,00**	**39,00**	**39,00**
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Artikel ini berkaitan dengan penggunaan karbon aktif dan CaO untuk mereduksi kandungan merkuri pada lindi artifisial. Studi ini menunjukkan bahwa karbon aktif termodifikasi dari tanah gambut dan batu bara, serta penggunaan CaO dari produk sampingan kulit kerang sebagai buffer pH dapat digunakan untuk mereduksi kandungan merkuri. Hasil penelitian menunjukkan bahwa adsorben terbaik untuk menurunkan adalah karbon aktif dari tanah gambut yang teraktivasi dalam kondisi asam. Adsorben ini menunjukkan kemampuan yang lebih baik daripada penelitian sebelumnya yang menggunakan bahan yang umum digunakan, seperti karbon aktif yang dihasilkan dari limbah pertanian. Ruang lingkup pembahasan pada artikel ini sudah baik didukung dengan berbagai analisis termasuk micro analisis.

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Mercury removal using modified activated carbon of peat soil and coal in simulated landfill leachate

Budihardjo M.A.[a], Wibowo Y.G.[a,b], Ramadan B.S.[a], Serunting M.A.[c], Yohana E.[d], Syafrudin[a]

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Abstract

This study focuses on the production of activated carbon from peat soil and coal, and the use of CaO from clamshell byproducts as a pH buffer, to reduce mercury content in artificial landfill leachate. Activated carbon from coal and peat soil was characterized according to its water content, ash content,

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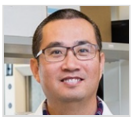

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Mercury removal using modified activated carbon of peat soil and coal in simulated landfill leachate

Mochammad Arief Budihardjo [a,*], Yudha Gusti Wibowo [a,b], Bimastyaji Surya Ramadan [a], Muhamad Allan Serunting [c], Eflita Yohana [d], Syafrudin [a]

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ABSTRACT

This study focuses on the production of activated carbon from peat soil and coal, and the use of CaO from clamshell byproducts as a pH buffer, to reduce mercury content in artificial landfill leachate. Activated carbon from coal and peat soil was characterized according to its water content, ash content, iodine sorption, methilene blue sorption, and by XRD, SEM, and FTIR analysis. Clamshell was characterized using XRF analysis. The results indicate that the equilibrium point for mercury reduction was reached after 100 min of agitation at 500 rpm at different pH levels. These results also suggest that mercury does not undergo precipitation at neutral or near alkaline pH. Mercury content was successfully reduced by 81% during the adsorption process. The adsorption capacities of activated carbon in coal and peat soil are 114 mg/g and 102 mg/g. The Langmuir isotherm model was used as it was most appropriate for mercury adsorption. This study shows that activated carbon from peat soil and coal can be utilized as a low-cost adsorbent for treating landfill leachate.

1. Introduction

Many studies have been performed on the release of methylmercury into the environment, particularly in Asia. The latest scientific reports indicate that more than 33 regions across Asia have experienced a decrease in environmental quality due to mercury contamination. According to the European Environmental Agency (EEA), mercury has been contaminating more than 46,000 surface water bodies. EEA reported that the current mercury level in the oceans and atmosphere is about 200% and 500% above natural levels (European Environment Agency, 2018). In Indonesia, gold mining in the Talawaan watershed on North Sulawesi Island has resulted in mercury pollution (Li et al., 2009), and various other regions in Indonesia have also experienced very significant decreases in environmental quality a result of mercury contamination from illegal gold mines (Spiegel et al., 2018). This fact is not widely reported, however, because the affected regions are remote and prone to social conflict. Some studies have reported efforts to reduce mercury concentrations in

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Experimental investigation and application of mine airflow purification and reuse technology

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ABSTRACT

To solve the problem of dust concentration higher than the standard on the -415 m roadway in the Fankou lead-zinc mine, a self-made dedusting equipment consisted of chord grid is proposed in this paper. This equipment aims to purify the polluted airflow for deep ventilation in mine. First of all, an image observation is shown that three types of water films on the chord grid surface. Specifically, the chord grid is wetted by the fog drops to form water films and can remove dust from airflow. Then, it is measured that a total dust removal efficiency and resistance are resulted by a single layer of wet chord grids under the conditions of different nozzle out diameters, water spray pressure, and velocities. The results show that: The dust removal efficiency is higher at the experimental conditions meet this conditions(the velocity is 3.5 m/s, the nozzle outlet diameter is 2 mm, and the water supply pressure is 0.75 MPa); (2) The spray pressure seldom influences the resistance of dust removed equipment, whereas this resistance correlates positively with velocities and nozzle out diameters. Finally, one purification system is optimally designed according to the experimental, and applied it in the -415 m middle section of the FKLZM. The field test data showed that the mass concentration of dust meets the quality standard of fresh airflow in metal mine.

1. Introduction

China has become one of the largest countries in exploiting and utilizing mineral resources in the world (Chen and Chen, 2015). Many pollution sources exist in the underground production process, especially in mining, transferring, ore slipping, and screening, which contaminates the fresh airflow of ventilation shafts supplied by main fans. With the increase of resource consumption and the increasing demand, deep mineral resources exploitation is an inevitable choice under economic development and resource shortage (Dou et al., 2020). The problem of insufficient ventilation has appeared in the underground mining environment to the extent of depth. One approach to solve this problem is controlled circulation ventilation, which can effectively tackle ventilation in deep mining and improve the working condition of deep mining by saving energy and reducing consumption (Wang et al., 2014). Among this controlled circulation ventilation, the high-efficiency and low-resistance dust removal technology should be discussed.

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Enhanced pilot bioremediation of oily sludge from petroleum refinery disposal under hot-summer Mediterranean climate

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ABSTRACT

Large pilot scale bioremediation approaches were implemented for the treatments of oily sludge (OS) characterised by alkaline pH (pH > 9), high concentration of metals (3% dry weight) and high total petroleum hydrocarbons content (TPH) ranging between 22,000 and 67,300 mg kg^{-1} from a Tunisian petroleum refinery. The treatments included bioaugmentation and biostimulation approaches with autochthonous isolated bacterial strains and consortia. Chemical, microbial, and ecotoxicological analyses were performed over a period of 180 days incubation. The bioremediation treatments favoured the development of *Proteobacteria*, *Firmicutes* and *Bacteroidetes* following an ecological succession of specialist bacterial groups, first associated to hydrocarbon degradation (e.g. *Marinobacter* and *Alcanivorax*) that resulted in a greater extent of TPH-degradation (up to 80%), and the selection of metal resistant bacteria including *Hyphomonas*, *Phaeobacter*, and *Desulfuromusa*. The best performances were obtained when bioaugmentation and biostimulation were combined. Over 90% of the TPH initial concentration was degraded over 180 days, which was accompanied with a 3-fold reduction of ecotoxicity. Our study demonstrates the efficacy of large pilot scale bioremediation of highly contaminated oily sludge, providing the evidence that the management of autochthonous microbial communities is of paramount importance for the success of the bioremediation process.

1. Introduction

The production of large amounts of waste by oil refineries and petrochemical industries is a major environmental concern (Srinivasarao Naik et al., 2011). Oily sludge (OS), residue of the petroleum refining processes, represents the most substantial solid wastes produced by the petroleum industry (Hu et al., 2013). It corresponds up to 1/3 and 1/4 of the initial volume of the crude oil used during refining process. OS is constituted of water, sediment, aliphatic and aromatic hydrocarbons, resins and asphaltenes, and metals (Vdovenko et al., 2015), all of which are potentially toxic compounds

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